DRAFT
TONOPAH GRAZING ENVIRONMENTAL IMPACT STATEMENT

U.S. Department of the Interior
Bureau of Land Management
Battle Mountain, Nevada

DRAFT

ENVIRONMENTAL IMPACT STATEMENT

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PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM

for the

TONOPAH RESOURCE AREA

Nye County, Nevada

Prepared by

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT
BATTLE MOUNTAIN DISTRICT

State Director
Nevada State Office

The Bureau of Land Management proposes to implement a livestock grazing management program for the Tonopah Resource Area of the Battle Mountain District in Central Nevada. This program proposes to allocate vegetation to livestock, big game, and wild horses; determine the levels of livestock grazing management; identify needed livestock support facilities; outline a general implementation schedule; list the standard procedures for operation; and discuss the interrelationships with other programs of the area. Three alternatives, No Action, No Livestock Grazing, and Livestock Reduction/Maximizing Wild Horses, were considered along with the proposed action. A discussion of the affected environment is briefly summarized and the environmental consequences occurring from the proposed action and each alternative are documented in the EIS.

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Date by which comments are due:

JUN 30 1980

SUMMARY

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The Bureau of Land Management (BLM) proposes to implement a livestock grazing management program in the Tonopah Resource Area of the Battle Mountain District. The Tonopah Grazing Environmental Impact Statement (EIS) involves approximately 3.6 million acres of public land located in central Nevada (Land Status Map). Interspersed within these public lands are approximately 60,000 acres of private, state, and other lands. Two National Forests, the Toiyabe and Humboldt, share boundaries with much of the resource area.

In addition to the proposed action, three alternatives are being analyzed in this EIS. They are: No Action, No Livestock Grazing, and Livestock Reduction/Maximizing Wild Horses.

Components of the proposed action, the BLM's preferred alternative, and each alternative include: 1) Vegetation Allocation Program (Summary Table 1), 2) Levels of Grazing Management (Summary Table 2), 3) Livestock Support Facilities (Summary Table 3), 4) General Implementation Schedule, 5) Standard Operating Procedures, and 6) Interrelationships.

MAJOR CONCLUSIONS

Analysis of the proposed action and each alternative has indicated that there would be no significant impacts to the soils resource because erosion rate changes do not exceed the Soil Conservation Service (SCS) rating for significance of three to five tons per acre per year. Also, there would be no significant impacts to water resources except in the No Livestock Grazing alternative when the major source of coliform contamination would be removed.

Under the proposed action and each alternative, continued livestock and wild horse use would result in degradation of riparian and wetland habitat in areas where current conditions are poor. Where current conditions are good, riparian communities would remain static. The least deterioration (except for No Livestock Grazing) would be found under the proposed action. The greatest degradation would occur with the No Action alternative.

Livestock forage condition is expected to improve under the proposed action by the year 2015 as follows: good condition from 270,158 to 1,133,190 acres, fair condition from 1,118,887 to 1,534,848 acres, and poor condition from 2,096,808 to 817,815 acres. This improvement can be attributed to land treatment projects, burning and seeding, intensive management on 15 allotments, and improvement in erosion condition. Total available vegetation would increase from 148,458 AUMs to 184,127 AUMs. Big game numbers are expected to increase with mule deer population increasing from 8,425 to 10,410; antelope population increasing from 555 to 910; bighorn sheep population increasing from 115 to 210; and elk would be allowed to increase up to 100 animals. The average actual use for livestock would increase from 118,941 Animal Unit Months (AUMs) to 159,474 AUMs by the year 2015. Long-term benefits would include better livestock distribution, higher percentage calf crops (70-73 percent to 73-78 percent), increased calf weaning weights from 350-400 pounds to 360-420 pounds, improvement in livestock physical condition, and improved supervision. Net ranch income is expected to increase from $2,249,000 to $2,458,000; rancher wealth from $7,156,000 to $7,656,000; regional income from $31,174,000 to $31,871,000; and regional employment would increase from 2,871 work years to 2,909 work years by the year 2015.

Under the No Action alternative, continued over-utilization of the vegetation resource and continued yearlong grazing would result in a net loss of 5,544 AUMs. Total available vegetation would decrease from 148,458 AUMs to 142,914 AUMs by the year 2015. No change in existing big game numbers is expected under this alternative. Average actual livestock use would decrease by 1,235 AUMs through elimination of average trespass use. The actual livestock use would be 117,706 AUMs. In seven allotments where current over-utilization is occurring, there would be a decline in livestock forage condition; expected changes by 2015 for the resource are as follows: good condition from 270,158 to 107,566 acres, fair condition from 1,118,887 to 594,104 acres, and poor condition from 2,096,808 to 2,784,183 acres. Rancher and regional economic values are not expected to change.

Livestock forage condition would improve significantly under the No Livestock Grazing alternative as follows: good condition from 270,158 to 1,166,716 acres, fair condition from 1,118,887 to 1,531,563 acres and poor condition from 2,096,808

to 787,574 acres; with the only limiting factor being wild horse and big game use. Vegetation production would increase from 148,458 to 185,576 AUMs by the year 2015. Antelope, bighorn sheep, and elk populations would be expected to increase the same as under the proposed action. Mule deer would increase from 8,425 to 10,980 animals as competition for forage becomes less intense. Net ranch income is expected to decline from $2,249,000 to $466,000; rancher wealth from $7,156,000 to 0; regional income from $31,174,000 to $28,961,000; and regional employment would decline from 2,871 work years to 2,781 work years by the year 2015.

Under the Livestock Reduction/Maximizing Wild Horses alternative, livestock forage condition would show significant improvement over 35 years as follows: good condition from 270,158 to 1,022,788 acres, fair condition from 1,118,887 to 1,235,865 acres, and poor condition from 2,096,808 to 1,227,200 acres; because of intensive management in seven allotments (Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky). Total available vegetation is expected to increase from 148,458 AUMs to 183,022 AUMs by the year 2015. Big game numbers would be expected to increase the same as under the No Livestock Grazing alternative. The average actual livestock use would decrease from 118,941 AUMs to 59,725 AUMs by the year 2015 as seven allotments would have intensive management, eight allotments less intensive management, and five would have no livestock grazing. In the seven allotments with intensive management, percent calf crop and calf weaning weights would be the same as the proposed action. Net ranch income is expected to decline from $2,249,000 to $1,123,000; rancher wealth from $7,156,000 to $2,656,000; regional income would decline from $31,174,000 to $30,025,000; and regional employment would decline from 2,871 work years to 2,831 work years by the year 2015.

Cultural resources would be affected by livestock support facilities. Impacts to these resources would not be known until each facility is developed or constructed. Cultural resources would have continued disturbances by livestock and wild horses, which would continue as long as livestock and wild horses utilize the area. An estimated 698 cultural resource sites have potential to be impacted from construction of livestock support facilities under the proposed action. Under the Livestock Reduction/Maximizing Wild Horses alternative, a total of 219 sites have potential to be impacted. No direct impacts other than those from wild horses and/or livestock grazing would occur as a result of the other alternatives because no support facilities are proposed. Spring developments and land treatments would create the only visual impacts. Recreation resource opportunities would increase by the year 2015 as a result of implementation of the proposed action and alternatives (except for the No Action alternative). Hunter days would increase from 5,400 to 7,314 under the proposed action and up to 7,847 under the No Livestock Grazing and Livestock Reduction/Maximizing Wild Horses alternatives. There would be no significant impacts to the wilderness resource.

AREAS OF CONTROVERSY

Public contacts have been made with interest groups, local and state governments, other federal agencies, and numerous individuals to determine the areas of concern with the proposed livestock grazing management program for the Tonopah Resource Area. The main area of controversy which surfaced during these contacts was the allocation of vegetation. The present demand for vegetation by livestock, big game, and wild horses greatly exceeds that currently available by 10,293 AUMs (158,751 minus 148,458). Several interest groups and individuals expressed concern with allocating vegetation previously used by livestock to increasing numbers of wild horses and mule deer. Others were in favor of reserving vegetation strictly for use by big game animals.

SUMMARY TABLE 1
VEGETATION ALLOCATION PROGRAM (AUMs)

Type of Action	Proposed Initial Allocation Short-term Use--Year 1981 Livestock	Big Game	Wild Horses	Total	Estimated Future Allocation Long-term Use--Year 2015 Livestock	Big Game	Wild Horses	Total
Proposed Action	126,390	14,826	7,242	148,458	159,474	16,367	8,286	184,127
No Action Alternative	117,706 a/	12,996	26,814 b/	157,516	117,706	12,996	26,814	157,516
No Livestock Grazing Alternative	0	14,826	7,242	22,068	0	17,117	7,242	24,359
Livestock Reduction/ Maximizing Wild Horses Alternative	49,965	14,826	23,748	88,539	59,725	17,117	48,166	125,008

a/ Livestock use for the No Action alternative is based on the last five year average use (March 1, 1974 to February 28, 1979). This excludes 1,235 AUMs of trespass use that has occurred in the past.

b/ These Animal Unit Months (AUMs) would be utilized by wild horses but would not be allocated to them.

SUMMARY TABLE 2
PROPOSED LEVELS OF GRAZING MANAGEMENT

Type of Action	Intensive Management a/ Allotments	Acres	Less Intensive Management b/ Allotments	Acres	No Livestock Grazing c/ Allotments	Acres
Proposed Action	17 d/	3,432,258	3	184,475	0	0
No Action Alternative	2 d/	116,927	18	3,499,806	0	0
No Livestock Grazing Alternative	0	0	0	0	20	3,616,733
Livestock Reduction/ Maximizing Wild Horses Alternative	7	1,119,502	8	1,241,862	5	1,255,369

a/ Those allotments that would have a specified grazing system under an Allotment Management Plan (AMP).

b/ Those allotments that would not have an Allotment Management Plan.

c/ Those allotments where there would be no livestock grazing allowed.

d/ Two allotments, Wagon Johnnie and Willow Creek, have existing AMPs which would continue under intensive management.

SUMMARY TABLE 3
PROPOSED LIVESTOCK SUPPORT FACILITIES

Type of Action	Proposed Facilities							Land Treatments (Acres)			Estimated Cost (Dollars)
	Wells	Pipelines (Miles)	Reservoirs	Springs	Troughs	Fences (Miles)	Cattle Guards	Burning	Spraying	Seeding	
Proposed Action	19	118	5	20	76	807	102	18,800	16,405	35,205	$3,341,290
No Action Alternative	0	0	0	0	0	0	0	0	0	0	0
No Livestock Grazing Alternative	0	0	0	0	0	0	0	0	0	0	0
Livestock Reduction/ Maximizing Wild Horses Alternative	13	58	0	6	36	336	66	0	3,880	3,800	$1,311,965

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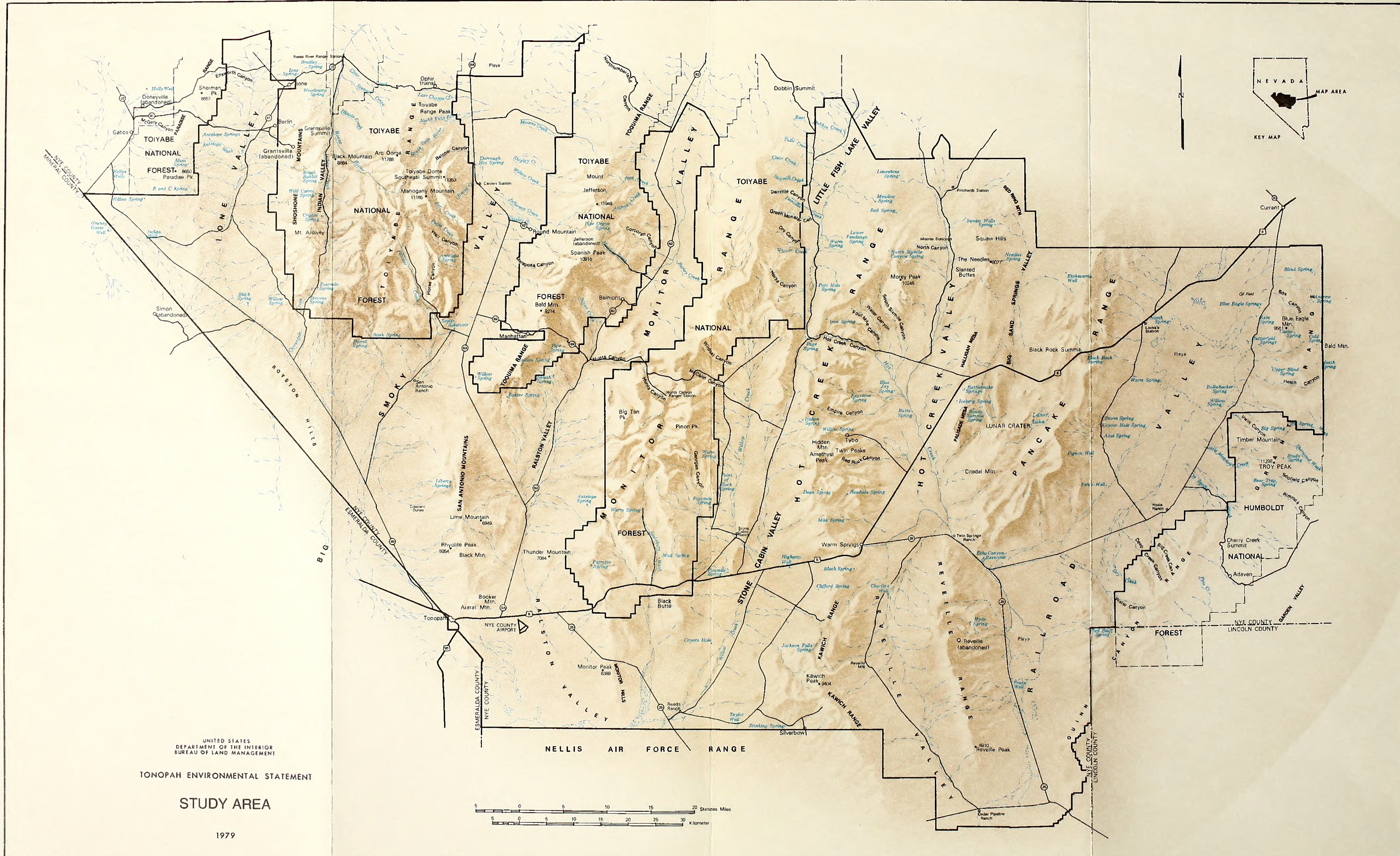
CHAPTER 1

ALTERNATIVES INCLUDING THE PROPOSED ACTION



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

TONOPAH ENVIRONMENTAL STATEMENT

STUDY AREA

1979

CHAPTER 1

ALTERNATIVES INCLUDING THE PROPOSED ACTION

PURPOSE AND NEED FOR ACTION

The purpose of the Tonopah Grazing Environmental Impact Statement (EIS) is to analyze the potential environmental impacts of implementating a grazing management program in the Tonopah Resource Area. This EIS is being prepared in compliance with section 102(2)C of the National Environmental Policy Act (NEPA) of 1969. It will follow recent guidance as outlined in the Council on Environmental Quality (CEQ) regulations of November 29, 1978. (Glossary words are in quotes where first used in the text. Acronyms are also listed in the glossary.)

A grazing management program is being proposed for the purpose of improving or maintaining the "public land" resources of soil, water, and vegetation. This grazing management program includes:

1) "vegetation allocation" to livestock, big game, and wild horses by "allotment;"

2) levels of grazing management including "periods-of-use," management intensity, "grazing treatments," "grazing systems," and "utilization" levels;

3) "livestock support facilities" including wells, pipelines, earthen reservoirs, springs, troughs, fences, cattleguards, and land treatments; and

4) a program to monitor the development and implementation of the grazing management program including standard operating procedures, implementation schedule, and range studies.

The general objectives of the proposal are as follows:

1) Improve habitat and forage for livestock, wildlife, and wild horses by allocation of consumptive vegetation within the productive capability of the vegetation resource;

2) Improve the vegetation resource by establishment of proper periods-of-use for livestock by allotment to meet the physiological needs of key species;

3) Reduce soil erosion and enhance "watershed" values by increasing ground cover and "litter";

4) Enhance recreation values by improving wildlife habitat, thereby increasing the potential for wildlife hunting and observation;

5) Improve the health and productivity of wild horse herds by reducing wild horse numbers and improving forage condition.

In addition to the proposed action (the BLM's preferred alternative) three alternatives are being analyzed in this EIS. They are: No Action, No Livestock Grazing, and Livestock Reduction/Maximizing Wild Horses.

Other alternatives that were considered but eliminated from study include:

Maximizing Livestock–This alternative was eliminated from detailed study because the proposed action does maximize livestock. Allocations of vegetation to livestock are inside and outside of big game and wild horse use areas. Where there is big game and wild horse use, all three users are allocated a portion of the available vegetation. Livestock are allocated vegetation up to preference and receive all of the available vegetation in areas where there are no big game or wild horses. Allocations to livestock under the proposed action exceed the last five year average "actual use." Therefore, livestock are maximized up to the amount of vegetation available under the proposed action.

Livestock "Permittes's" Alternative–The livestock permittees in the Tonopah Resource Area indicated they would like to submit an alternative for inclusion in the EIS. The necessary data required for analysis of this alternative was not received for inclusion in the draft. If adequate time is allowed for analysis, each suggested reasonable alternative not previously covered will be considered for inclusion in the Final EIS.

PROPOSED ACTION

VEGETATION ALLOCATION PROGRAM

The Battle Mountain District Office of the Bureau of Land Management (BLM) proposes to allocate available vegetation to big game (mule deer, antelope, bighorn sheep, and elk), wild horses, and livestock in the Tonopah Resource Area. Proposed allocations are based on recommendations from the Tonopah Management Framework Plan (MFP), 1979. Available vegetation would be allocated to reasonable numbers of big game

and "optimum numbers" of wild horses in use areas by allotment. Vegetation allocations to livestock would be to "grazing preference."

All vegetation allocations would be based on "Animal Unit Months" (AUMs) which is the amount of vegetation necessary for the subsistence of one cow or its equivalent (e.g., 4 deer, 5 antelope, 5 bighorn sheep, 1.25 elk, or 1 horse) for one month.

The proposed action is the Bureau's preferred alternative and would initially allocate 126,390 AUMs to livestock, 14,826 AUMs to big game, and 7,242 AUMs to wild horses for a total allocation of 148,458 AUMs for the Tonopah Resource Area. Proposed vegetation allocations by allotment are shown in Table 1-1 (see Appendix A for methodology of determining vegetation production and allocation for the proposed action and alternatives).

Estimated vegetation allocation for the future (year 2015) would be 159,474 AUMs to livestock, 16,367 AUMs to big game, and 8,286 AUMs to wild horses for a total of 184,127 AUMs. Estimated future production and vegetation allocation by allotment is shown in Table 1-2.

Estimated potential production for future use (year 2015) is based on vegetation becoming available to livestock, wild horses, and big game through water development in areas currently more than four miles from existing water, by increased vegetative production through "intensive grazing management," and from land treatments.

The current "authorized use" ("active use" plus "regular non-use") to livestock for 1978 was 150,320 AUMs. The five-year (March 1, 1974 to February 28, 1979) average actual use in the Tonopah Resource Area was 118,941 AUMs. This includes 1,035 AUMs of average trespass use which is documented in the Tonopah Resource Area trespass files.

LEVELS OF GRAZING MANAGEMENT

The proposed levels of livestock grazing management by allotment for the proposed action are shown in Table 1-1. Fifteen allotments (3,315,331 acres) are proposed for intensive grazing management, which is synonymous with Allotment Management Plans (AMP), and three allotments (184,475 acres) for less intensive grazing management (non-AMP). The remaining two allotments (116,927 acres) are currently under AMPs and would continue under existing management.

Four areas within the Tonopah Resource Area have been designated for livestock grazing only during certain periods to help meet the management objectives of each area. These areas are: Railroad Valley Wildlife Management Area, Morey Bench, North Six-Mile and South Six-Mile Canyons, and the area north of Carver's Station and west of Highway 376 (Levels of Livestock Grazing Management Map).

PERIODS-OF-USE

Periods-of-use, as recommended by the Tonopah MFP, are shown in Table 1-1. These periods-of-use are necessary to improve "livestock forage condition" by providing rest from grazing during the critical growth periods of key plant species. Other factors considered in establishing these recommended periods-of-use were periods of normal winter snow cover and periods of spring snow-melt when soils are soft or boggy.

These periods-of-use would be imposed on all allotments until proposed AMPs are implemented. They would also be important when grazing systems are designed for each allotment. The physiological needs of key plant species would be met during each grazing cycle through the application of grazing treatments for the proposed AMPs. Allotments not scheduled for AMPs would continue under these recommended periods-of-use.

GRAZING TREATMENTS

Grazing treatments are designed to improve rangeland forage condition by increasing the percent composition of key plant species by deferring grazing during the "critical growth period." The plants would then be given an opportunity to increase in density, composition, vigor, and production. The critical growth periods of key plant species for the Tonopah Resource Area are shown in Table 1-3 (Appendix F, Section 3, Table F-3 shows Key Plant Species by allotment). The following grazing treatments (singly or in various combinations) would be combined with scheduled grazing to form grazing systems that would be used in the Tonopah Resource Area:

Treatment 1: Defer livestock grazing from early spring to late spring (approximately April 1 to June 15).

This treatment would be required twice consecutively every five years to allow plants to increase vigor, litter, seed production, and seedling establishment. The following key forage species would benefit from this treatment: squirreltail, needle-and-thread, Indian ricegrass, crested wheatgrass, Great Basin wildrye, blue bunch wheatgrass, budsage, and spiny hopsage.

TABLE 1-1

PROPOSED ACTION--PRESENT DEMAND, EXISTING USE, AND PROPOSED VEGETATION ALLOCATION BY ALLOTMENT (AUMs)

	Ownership (Acres)		Present Demand							Existing Use							Proposed Allocation a/								
						Big Game Reasonable Numbers b/						Big Game													
Allotment	Public c/	Other	Livestock Grazing Preference d/	1978 Authorized Livestock Demand e/	Wild Horse Optimum Numbers f/	Mule Deer	Antelope	Bighorn Sheep	Elk	Livestock Last Five Year Ave. Actual Use g/	Wild Horses h/	Mule Deer	Antelope	Bighorn Sheep	Elk i/	Available Vegetation 1979 j/	Livestock	Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses	Total Allocation	Proposed Levels of Grazing Management k/	Proposed Periods of-Use l/
Blue Eagle	45,499	1,660	2,239	2,024	0	0	9	50	0	1,287	0	0	5	26	0	1,536	1,505	0	8	23	0	0	1,536	Non-AMP	6/16-4/15
Butterfield	122,080	891	5,249	4,779	0	1,427	26	253	0	1,464	0	810	17	127	0	3,949	2,934	754	26	235	0	0	3,949	Non-AMP	6/16-4/15
Crater Black Rock	97,859	465	8,433	5,725	0	95	33	0	0	5,217	0	55	19	0	0	3,476	3,348	95	33	0	0	0	3,476	AMP	11/1-3/31
Currant Ranch m/	11,160	0	335	282	0	313	0	59	0	167	0	178	0	31	0	501	282	173	0	46	0	0	501	AMP	6/1-10/31
Forest Moon m/	6,879	0	300	253	0	400	0	25	0	65	0	228	0	12	0	297	36	236	0	25	0	0	297	AMP	5/16-3/15
Francisco	16,896	1,226	1,299	1,299	0	0	0	0	0	1,008	0	0	0	0	0	1,114	1,114	0	0	0	0	0	1,114	Non-AMP	6/1-3/31
Hot Creek	189,507	2,660	8,850	8,850	0	4,244	0	0	0	7,118	756	2,357	0	0	0	7,132	4,434	2,698	0	0	0	0	7,132	AMP	6/1-3/31
Hunts Canyon	89,683	714	4,836	3,741	90	0	81	0	0	3,703	192	0	50	0	0	2,984	2,821	0	73	0	0	90	2,984	AMP	6/1-3/31
Ione	189,099	1,001	10,776	10,776	0	222	0	0	0	5,254	0	125	0	0	0	10,991	10,776	215	0	0	0	0	10,991	AMP	10/1-3/15
Monitor	96,338	6,457	7,720	4,011	12	69	31	0	0	3,573	12	41	19	0	0	3,166	3,063	60	31	0	0	12	3,166	AMP	7/1-11/30
Morey	118,609	467	2,250	2,250	0	4,154	0	0	0	1,698	852	2,387	0	0	0	2,467	815	1,652	0	0	0	0	2,467	AMP	6/1-3/31
Nyala	321,274	5,867	22,889	16,157	0	105	116	93	0	13,741	516	59	67	48	0	12,343	12,029	105	116	93	0	0	12,343	AMP	6/16-4/15
Ralston	368,682	5,988	16,617	14,695	60	94	196	0	0	13,034	132	54	120	0	0	14,446	14,098	92	196	0	0	60	14,446	AMP	6/1-3/31
Reveille	657,520	1,967	25,730	25,730	3,780	1,142	510	0	0	25,797	11,700	658	312	0	0	30,991	25,730	971	510	0	0	3,780	30,991	AMP	6/1-3/31
San Antone	440,826	11,122	13,205	13,205	0	991	0	0	0	10,515	0	494	0	0	0	11,482	10,667	815	0	0	0	0	11,482	AMP	6/1-3/15
Sand Springs	203,868	35	10,781	10,781	0	387	57	0	0	5,335	888	219	36	0	0	9,968	9,556	356	56	0	0	0	9,968	AMP	11/1-3/31
Smoky	126,976	11,820	5,821	5 821	0	2,291	35	0	0	4,130	0	1,297	22	0	0	6,483	5,821	628	34	0	0	0	6,483	AMP	5/16-3/15
Stone Cabin	397,051	3,665	15,664	15,244	2,700	1,821	610	0	0	12,393	10,920	1,037	372	0	0	17,130	12,664	1,174	592	0	0	2,700	17,130	AMP	6/1-3/31
Wagon Johnnie n/	104,236	2,836	7,845	4,359	600	1,885	432	0	250	3,172	792	1,065	264	0	250	7,526	4,359	1,885	432	0	250	600	7 526	Existing AMP	5/16-11/15
Willow Creek n/	12,691	0	338	338	0	131	7	0	0	270	54	130	5	0	0	476	338	131	7	0	0	0	476	Existing AMP	6/10-10/9
TOTALS	3,616,733	58,841	171,177	150,320	7,242	19,771	2,143	480	250	118,941	26,814	11,194	1,308	244	250	148,458	126,390	12,040	2,114	422	250	7,242	148,458		

a/ The proposed allocation catagorizes the current available vegetation by each major use.

b/ Big game reasonable numbers are the total number of AUMs of big game demand on public lands as determined by the Nevada Department of Wildlife and the Bureau of Land Management.

c/ Public lands are administered by the Bureau of Land Management, Battle Mountain District.

d/ Livestock grazing preference is the total number of AUMs of livestock grazing demand on public lands, apportioned and attached to a land base or water base property controlled by a permittee or lessee.

e/ The 1978 authorized livestock demand includes active use plus regular nonuse.

f/ Wild horse optimum numbers are the projected number of AUMs of wild horse demand on public lands as determined by the Tonopah Management Framework Plan.

g/ The last five year average use includes livestock actual use and documented trespass use from March 1, 1974 to February 28, 1979.

h/ Current 1979 use.

i/ Tonopah Management Framework Plan (MFP) recommended elk introduction (the Wagon Johnnie AMP allows AUMs for elk use).

j/ Available vegetation as determined by the 1979 vegetation allocation procedures; see Appendix A, Section 1.

k/ The proposed levels of grazing management have been identified by allotment as recommended in the Tonopah Management Framework Plan.

l/ The proposed periods-of-use have been identified by allotment as recommended in the Tonopah Management Framework Plan.

m/ The majority of this allotment is located within the Bureau of Land Management, Ely, District. On allotments proposed for AMPs the recommended periods-of-use would be applied until the AMPs are developed. Allotments not scheduled for AMPs would continue under the established periods-of-use--Wagon Johnnie 5/16-11/15 and Willow Creek 6/10-10/9.

n/ Currently under an approved Allotment Management Plan (AMP).

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area. Grazing files, Tonopah Management Framework Plan; and Range Survey files, compiled 1979.

TABLE 1-2
PROPOSED ACTION--ESTIMATED FUTURE PRODUCTION AND USE, YEAR 2015 (AUMs)

Allotment	Available Vegetation 1979 c/	Estimated Future Available Production a/					Estimated Use--Year 2015 b/					
		Water Development	Erosion Condition Improvement	Improvement Through Management d/	Land Treatments	Estimated Available Vegetation 2015	Livestock	Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses
Blue Eagle	1,536	0	0	75	0	1,611	1,565	0	9	37	0	0
Butterfield	3,949	5	2	200	0	4,156	3,071	806	26	253	0	0
Crater Black Rock	3,476	119	0	550	0	4,145	4,017	95	33	0	0	0
Currant Ranch e/	501	0	0	25	0	526	286	181	0	59	0	0
Forest Moon e/	297	0	0	0	0	297	36	236	0	25	0	0
Francisco	1,114	0	0	57	0	1,171	1,171	0	0	0	0	0
Hot Creek	7,132	12	0	785	0	7,929	4,775	3,154	0	0	0	0
Hunts Canyon	2,984	3	184	325	0	3,496	3,325	0	81	0	0	90
Ione	10,991	4,448	286	950	440	17,115	16,893	222	0	0	0	0
Monitor	3,166	0	78	375	1,600	5,219	5,107	69	31	0	0	12
Morey	2,467	0	6	200	0	2,673	841	1,832	0	0	0	0
Nyala	12,343	79	0	1,644	0	14,066	13,752	105	116	93	0	0
Ralston	14,446	1,344	28	1,425	0	17,243	16,893	94	196	0	0	60
Reveille	30,991	1,228	0	1,980	0	34,199	28,383	1,142	510	0	0	4,164
San Antone	11,482	4,484	87	1,600	0	17,653	16,710	943	0	0	0	0
Sand Springs	9,968	2,219	0	1,100	1,833	15,120	14,675	388	57	0	0	0
Smoky	6,483	30	0	730	0	7 243	6,500	708	35	0	0	0
Stone Cabin	17,130	151	151	1,710	2,581	21,723	16,273	1,516	610	0	0	3,324
Wagon Johnnie	7,526	0	0	500	0	8,026	4,823	1,885	432	0	250	636
Willow Creek	476	0	0	40	0	516	378	131	7	0	0	0
TOTALS	148,458	14,122	822	14,271	6,454	184,127	159,474	13,507	2,143	467	250	8,286

a/ Estimated future production that would become available through development of water, improvement of erosion condition, intensive grazing management, and land treatments, see Appendix A, Section 1.

b/ Estimated use by kind of animal by year 2015.

c/ Current available vegetation as determined by the 1979 vegetation allocation procedures; see Appendix A, Section 1.

d/ Improvement through management would be accomplished by implementing intensive grazing on 15 allotments, by deferring grazing during the critical growing period of key plant species on three allotments, and by maintaining existing intensive management on two allotments.

e/ The majority of this allotment is located within the Bureau of Land Management, Ely District.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Range Survey files and Tonopah Management Framework Plan, compiled 1979.

TABLE 1-3
KEY VEGETATION FACTORS

Key Species a/	Critical Growth Period b/	Average Utilization Levels c/
Grasses:		
Alkali cordgrass (Spartina gracilis)	5/1-7/15	50
Alkali sacaton (Sporobolus airoides)	5/1-7/15	50
Bluebunch wheatgrass (Agropyron spicatum)	3/15-7/31	50
Crested wheatgrass (Agropyron desertorum)	4/1-6/30	50
Galleta (Hilaria jamesii)	4/15-7/15	50
Great Basin wildrye (Elymus cinereus)	3/15-8/15	50
Indian ricegrass (Oryzopsis hymenoides)	4/15-6/30	50
Needle-and-thread (Stipa comata)	4/15-6/30	50
Squirreltail (Sitanion hystrix)	4/15-6/30	40
Shrubs:		
Apache plume (Fallugia paradoxa)	4/15-7/15	40
Black sagebrush (Artemisia nova)	5/15-9/30	30
Bitterbrush (Purshia spp.)	4/15-6/30	50
Budsage (Artemisia spinescens)	3/1-6/15	30
Cliffrose (Cowania mexicana)	5/10-7/24	50
Fourwing saltbush (Atriplex canescens)	4/1-8/15	50
Shadscale (Atriplex confertifolia)	4/1-7/15	20
Spiny hopsage (Grayia spinosa)	3/15-6/30	20
Winterfat (Ceratoides lanata)	4/1-10/15	50

a/ These are the current known key species in the Tonopah Resource Area. Others may be identified through studies or vegetation surveys.

b/ Based on 1976-78 phenological studies conducted by BLM personnel in the Tonopah Resource Area.

c/ Average utilization levels were taken from Battle Mountain District Proper Use Factor Table. These are the average allowable levels for season-long use. Under intensive grazing management these levels may be exceeded at least one year each grazing cycle.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Management Framework Plan, Step 2, 1976; Phenological Study files, 1976-78; Proper Use Factor Table, Range Survey file, 1976.

Treatment 2: Defer livestock grazing from late winter to late summer (approximately March 1 to September 15).

This treatment would be implemented twice consecutively every five years to give the same benefits as Treatment 1, but to plants which have a longer growing season. The following key forage species would benefit from this treatment: Great Basin wildrye, galleta, alkali sacaton, alkali cordgrass, winterfat, fourwing salt bush, black sagebrush, and shadscale.

Treatment 3: Defer livestock grazing from late winter of the first year to midsummer of the following year-providing 16 months rest from grazing (approximately March 15 until July 15).

This treatment would be implemented once every five years to benefit forage species in riparian areas and key shrub species for big game. It would improve vigor and seed production of bitterbrush, cliffrose, and Apache plume.

Treatment 4: Livestock grazing from midsummer to fall (approximately July 16 to November 1).

This treatment would provide better seed dispersal and trampling. When coupled with other treatments that allow spring rest the following year, it would allow increased seedling establishment.

Treatment 5: Defer livestock grazing two months in the spring (dates vary by allotment).

This treatment would be designed to help meet the needs of key species in non-AMP allotments. Increased vigor of all key species would be provided by this treatment. exact time of spring rest would vary by allotment according to its "key species;" see Table 1-1 for proposed periods-of-use and Appendix F, Section 3, for key plant species by allotment. This treatment would be applied every year.

GRAZING SYSTEMS

Two allotments, Wagon Johnnie and Willow Creek, are currently managed under existing AMPs. A brief discussion of the grazing systems for each AMP follows:

Wagon Johnnie Allotment

Wagon Johnnie was developed through a joint effort by the BLM, Toiyabe National Forest, and livestock permittee. Grazing administration for this allotment is under BLM direction. Wagon Johnnie has livestock use from May 16 to November 15. In order to provide for the needs of the key species, crested wheatgrass and Indian ricegrass, a four pasture rest rotation grazing system was developed utilizing the following grazing treatments:

Treatment A: Graze livestock May 16 to June 30 for livestock production.

Treatment B: Defer livestock grazing until July 1 (early summer) to improve vigor of key species.

Treatment C: Defer livestock grazing until after "seed ripe" (August 1) for seed production of key species.

Treatment D: Defer livestock grazing season-long for seedling establishment and increased vigor of the key species and for increased accumulation of litter.

Willow Creek Allotment

Willow Creek AMP was also developed through a joint effort by the BLM, Toiyabe National Forest, and livestock permittee with grazing administration being under Forest Service direction. Grazing periods on this AMP are from late spring to early fall (approximately June 10 to October 9). A three pasture rest rotation system was developed with the following grazing treatments:

Treatment A: Graze livestock season-long (June 10 to October 9) for livestock production.

Treatment B: Defer livestock grazing until after seed ripe (July 20) for seed production of Indian ricegrass.

Treatment C: Defer livestock grazing season-long for seedling establishment and increased vigor of the key species and for accumulation of litter.

UTILIZATION LEVELS

"Utilization" refers to the percentage of the annual production of forage that has been removed by animals throughout a grazing period or grazing season under continued use and management. The average utilization of key plant species recommended for the Tonopah Resource Area are shown in Table 1-3. The utilization levels may be exceeded during each grazing cycle under intensive grazing management. The periodic rest from grazing would allow the key plant species to increase in vigor and production.

LIVESTOCK SUPPORT FACILITIES

The development of "livestock support facilities" would be required in order to facilitate inten-

sive grazing management, make available AUMs previously not allocated because of the physical lack of water (areas more than four miles from water) and critical erosion areas, and improve livestock forage condition and trend. These facilities consist of fences, wells, springs, troughs, pipelines, tanks, and cattleguards.

Land treatments, such as spraying and burning, are also proposed and will include reseeding in the affected areas. Ten sites averaging 3,500 acres in size are proposed in four allotments for burning and spraying (Chapter 3, Table 3-3). Burning is the least costly method and was proposed on three sites where there was enough understory to carry the fire. Spraying with the herbicide 2,4-D would be done on the remaining seven sites. This chemical is not poisonous to livestock, wildlife, or man at recommended methods and ratyes of application (LD_{50} 300-1000). No spraying would be done within one mile of perennial waters.

Livestock support facilities would be based on the MFP Step 2 recommendations (Table 1-4). Approximate locations of boundary fences, highway fences, water developements, and land treatments are shown on the Range Facilities and Land Treatments–Proposed Action and Alternatives Map. Locations for interior fences would not be known until intensive management plans are written, therefore, they are not included on this map. However, approximately 233 miles of interior fencing are estimated and included for analysis purposes.

GENERAL IMPLEMENTATION SCHEDULE

Adjustments in livestock use would be made by the District Manager following filing of the Final EIS (September 30, 1980). Levels of grazing use would be based on available vegetation and the results of subsequent vegetative studies ("range trend," utilization, etc.). Significant downward adjustments in livestock use would be made in accordance with the grazing decisions. Detailed livestock grazing plans (AMPs) would be developed for each allotment scheduled for intensive grazing management (Table 1-1). Allotments scheduled for less intensive grazing management (non-AMPs) would continue to be authorized for livestock use up to grazing capacity. However, until AMPs are implemented, livestock grazing would be deferred for a minimum of two months during the critical growth period of the key plant species (exact time varies by allotment–Table 1-3, and Appendix F, Key Plant Species by Allotment). Non-AMP allotments would have livestock grazing deferred for a minimum of two months in the spring.

Implementation of allotments scheduled for intensive grazing management (AMPs) would begin after the District Manager's decision. The criteria used in determining the order of priority of AMP implementation are based on the following: 1) condition of the soil and vegetation resources and the rate of deterioration; 2) impact of reduction or proposed periods-of-use on the livestock operations; 3) potential of the area for improvement and the anticipated rate of recovery; and 4) the economic return from investment (Table 1-5). For analysis purposes, it is assumed that all intensive management would be implemented within seven years.

NO ACTION ALTERNATIVE

VEGETATION ALLOCATION PROGRAM

This alternative reflects continuation of the current grazing management program. While current use would be the basis of analysis for this alternative, actual use differs substantially. Table 1-6 projects the use by allotment. Use in the future (year 2015) is projected to remain the same.

The current level of livestock use (last five year average–March 1, 1974 to February 28, 1979) would be 117,706 AUMs. This excludes 1,235 AUMs of average trespass use that has occurred in the past. Existing livestock support facilities would be maintained, but no new facilities would be constructed. The two existing Allotment Management Plans (Wagon Johnnie and Willow Creek) would continue under current grazing management.

Current and future big game use is estimated to be 12,996 AUMs. Because wildlife numbers are not under BLM control, it is expected they would fluctuate according to population dynamics and habitat conditions.

Estimated wild horse use during 1979 was 26,814 AUMs. Excess wild horses would be gathered to maintain this average use level.

LEVELS OF GRAZING MANAGEMENT

The levels of grazing management for the No Action alternative would remain the same as they were for the 1978 grazing season and are shown in Table 1-6.

TABLE 1-4
LIVESTOCK SUPPORT FACILITIES
FOR THE PROPOSED ACTION a/

Facilities	Number	Cost/Unit b/	Total Initial Cost
Wells	19 ea	$11,500 ea c/	$218,500
Pipelines	118 mi	4,200/mi	495,600
Earthen Reservoirs	5 ea	5,000 ea	25,000
Springs	20 ea	2,300 ea	46,000
Troughs	76 ea	500 ea	38,000
Fences	807 mi	2,300/mi	1,856,100
Cattleguards	102 ea	1,200 ea	122,400
Subtotal			$2,801,600
Land Treatments			
Burning	18,800 ac	3.50 ac	65,800
Spraying	16,405 ac	8.50 ac	139,443
Seeding	35,205 ac	9.50 ac	334,447
Subtotal			$539,690
Grand Total			$3,341,290

a/ Approximate locations are shown on the Livestock Support Facilities Map; see Appendix B, Section 1 for a list of proposed livestock support facilities by allotment.

b/ Cost per unit includes actual cost and installation and was developed by the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1979.

c/ Wells differ in depth (150-700 feet); therefore, this reflects average unit cost.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Tonopah Unit Resource Analysis and office files, 1979. Nevada State Office, Division of Technical Services, project cost files, 1979.

TABLE 1-5
GENERAL IMPLEMENTATION SCHEDULE
FOR THE PROPOSED ACTION

AMP Allotments	Priority a/
Stone Cabin	1
Reveille	2
Morey	3
Hot Creek	4
Crater Black Rock	5
Sand Springs	6
Nyala	7
Hunts Canyon	8
Ione	9
San Antone	10
Smoky	11
Monitor	12
Ralston	13
Currant Ranch b/	14
Forest Moon b/	15

a/ The criteria used to determine the priority of AMP implementation are based on the following: 1) Condition of soil and vegetative resources and the rate of deterioration; 2) impact of reduction for proposed periods-of-use on the livestock operations; 3) potential of area for implementation and the anticipated rate of recovery; and 4) economic return from investment. The order of implementation might change.

b/ The majority of these allotments lie within the Ely District; therefore AMPs would not be implemented until the total allotment has been analyzed. The Egan EIS which covers the remainder of these two allotments is scheduled to be completed by the Ely District in 1984.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Tonopah Management Framework Plan, 1979.

TABLE 1-6
NO ACTION ALTERNATIVE--CURRENT AND FUTURE USE (AUMs)

Allotment	Available Vegetation 1979 b/	Existing Use a/ Livestock Last Five Year Average Use c/	Big Game Mule Deer	Antelope	Bighorn Sheep	Elk d/	Wild Horses e/	Total Vegetation Used	Unused Vegetation f/	Overused Vegetation g/	Future Available Vegetation 2015 h/	Levels of Grazing Management
Blue Eagle	1,536	1,287	0	5	26	0	0	1,318	218	0	1,536	Non-AMP
Butterfield	3,949	1,457	810	17	127	0	0	2,411	1,538	0	4,936	Non-AMP
Crater Black Rock i/	3,476	5,217	55	19	0	0	0	5,291	0	1,815	1,738	Non-AMP
Currant Ranch i/	501	167	178	0	31	0	0	376	125	0	626	Non-AMP
Forest Moon i/	297	65	228	0	12	0	0	305	0	8	297	Non-AMP
Francisco	1,114	1,008	0	0	0	0	0	1,008	106	0	1,114	Non-AMP
Hot Creek	7,132	6,996	2,357	0	0	0	756	10,109	0	2,977	5,349	Non-AMP
Hunts Canyon	2,984	3,691	0	50	0	0	192	3,933	0	949	2,238	Non-AMP
Ione	10,991	5,251	125	0	0	0	0	5,376	5,615	0	16,487	Non-AMP
Monitor	3,166	3,489	41	19	0	0	12	3,561	0	395	3,166	Non-AMP
Morey	2,467	1,567	2,387	0	0	0	852	4,806	0	2,339	617	Non-AMP
Nyala	12,343	13,520	59	67	48	0	516	14,210	0	1,867	12,343	Non-AMP
Ralston	14,446	12,988	54	120	0	0	132	13,294	1,152	0	14,446	Non-AMP
Reveille	30,991	25,597	658	312	0	0	11,700	38,267	0	7,276	23,243	Non-AMP
San Antone	11,482	10,304	494	0	0	0	0	10,798	684	0	11,482	Non-AMP
Sand Springs	9,968	5,335	219	36	0	0	888	6,478	3,490	0	12,460	Non-AMP
Smoky	6,483	4,055	1,297	22	0	0	0	5,374	1,109	0	8,104	Non-AMP
Stone Cabin	17,130	12,283	1,037	372	0	0	10,920	24,612	0	7,482	12,848	Non-AMP
Wagon Johnnie j/	7,526	3,159	1,065	264	0	250	792	5,530	1,996	0	9,408	AMP
Willow Creek j/	476	270	130	5	0	0	54	459	17	0	476	AMP
TOTALS	148,458	117,706	11,194	1,308	244	250	26,814	157,516	16,050	25,108	142,914	

a/ Existing use is the current use in the Tonopah Resource Area. It is projected that use in the future (year 2015) would remain the same.

b/ Available vegetation is determined by the 1979 vegetation allocation procedures; see Appendix A, Section 1.

c/ The last five year average use includes livestock active use from March 1, 1974 to February 28, 1979 (this excludes 1,235 AUMs of average trespass use).

d/ Tonopah Management Framework Plan (MFP) recommended elk introduction. (The Wagon Johnnie AMP allows AUMs for elk use.)

e/ Current 1979 use (the existing 26,814 AUMs use would be maintained).

f/ The AUMs that are being used in 11 allotments are less than the available vegetation.

g/ The AUMs being used in nine allotments are in excess of available vegetation.

h/ Future available vegetation (year 2015) is projected to remain static for seven allotments, increase for six allotments, and decrease for seven allotments for a total overall decrease in available vegetation of 5,544 AUMs; see Appendix A, Section 1, Table A-1.

i/ The majority of this allotment is located within the Bureau of Land Management, Ely District.

j/ Currently under an intensive grazing management plan (Allotment Management Plan-AMP).

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area. Range Survey files, Wildlife files, and Wild Horse files, compiled 1979.

NO LIVESTOCK GRAZING ALTERNATIVE

VEGETATION ALLOCATION PROGRAM

This alternative assumes the elimination of livestock grazing from BLM-administered public lands within the Tonopah Resource Area. Available vegetation would be allocated to reasonable numbers of big game where possible and to optimum numbers of wild horses in use areas by allotment as identified in the Tonopah Management Framework Plan (MFP); see Tables 1-7 and 1-8.

Under this alternative, 14,826 AUMs would be initially allocated to big game. Estimated future use (year 2015) would provide 17,117 AUMs for big game. It is estimated that through the removal of livestock and the reduction of wild horse use in big game use areas, vegetation production would increase in 35 years.

Wild horses would be initially allocated 7,242 AUMs as recommended in the Tonopah MFP. Excess wild horses would be gathered as necessary to maintain an average use at this level.

Livestock trailing permits would be issued as necessary to allow livestock to move to and from national forest lands and private lands. Livestock support facilities would not be maintained or constructed unless necessary for other resource uses such as wildlife or wild horses.

GENERAL IMPLEMENTATION SCHEDULE

Livestock removal would begin after the District Manager's decision resulting in no livestock grazing on BLM-administered public lands in the Tonopah Resource Area.

LIVESTOCK REDUCTION/ MAXIMIZING WILD HORSES ALTERNATIVE

VEGETATION ALLOCATION PROGRAM

This alternative proposes an approximate 60 percent resource area wide reduction in livestock use below that of the proposed action. Available vegetation outside of big game and wild horse use areas and up to total grazing preference (Class I Demand) would be allocated to livestock; see Tables 1-9 and 1-10. Vegetation in big game and wild horse use areas would not be allocated to livestock.

Seven allotments (Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky) would have less than a 40 percent reduction in livestock grazing and would have intensive grazing management (AMPs). Five allotments (Forest Moon, Hunts Canyon, Reveille, Stone Cabin, and Wagon Johnnie) are totally covered by big game and/or wild horse use areas; therefore, they would not include livestock grazing. The remaining eight allotments would receive a significant reduction (more than 40 percent) in livestock grazing. They would have less intensive management resulting in 49,965 AUMs available for allocation to livestock. Future projections for livestock use would be 59,725 AUMs. This increase in vegetation is projected to result from intensive livestock grazing management in seven allotments and two proposed land treatments in Monitor allotment.

Big game would be allocated available vegetation up to 14,826 AUMs to meet reasonable numbers where possible by use area by allotment. Future projections of available vegetation to big game would be 17,117 AUMs. It is estimated that through the removal of livestock from big game use areas, the available vegetation would increase in 35 years.

Wild horses would be allocated available vegetation to maximum numbers in use areas in Hunts Canyon, Monitor, Ralston, Reveille, Stone Cabin, and Wagon Johnnie allotments as identified in the Tonopah MFP. This would result in 23,748 AUMs initially being allocated to wild horses. Because this alternative proposes to maximize wild horses, existing (1979) use would become the initial allocation. Current wild horse numbers would be allowed to increase to available vegetation (48,166 AUMs) by use area by allotment and would be maintained at that level.

LEVELS OF GRAZING MANAGEMENT

The levels of grazing management for the Livestock Reduction/Maximizing Wild Horses alternative are shown on Table 1-9. Intensive grazing management would occur in seven allotments, less intensive grazing would occur in eight allotments, five allotments would contain no livestock grazing.

TABLE 1-7
NO LIVESTOCK GRAZING ALTERNATIVE--INITIAL ALLOCATIONS (AUMs)

Allotment	Available Vegetation 1979 b/	Initial Allocations a/ Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses	Total Used	Total Unused
Blue Eagle	1,536	0	8	23	0	0	31	1,505
Butterfield	3,949	754	26	235	0	0	1,015	2,934
Crater Black Rock	3,476	95	33	0	0	0	128	3,348
Currant Ranch c/	501	173	0	46	0	0	219	282
Forest Moon c/	297	236	0	25	0	0	261	36
Francisco	1,114	0	0	0	0	0	0	1,114
Hot Creek	7,132	2,698	0	0	0	0	2,698	4,434
Hunts Canyon	2,984	0	73	0	0	90	163	2,821
Ione	10,991	215	0	0	0	0	215	10,776
Monitor	3,166	60	31	0	0	12	103	3,063
Morey	2,467	1,652	0	0	0	0	1,652	815
Nyala	12,343	105	116	93	0	0	314	12,029
Ralston	14,446	92	196	0	0	60	348	14,098
Reveille	30,991	971	510	0	0	3,780	5,261	25,730
San Antone	11,482	815	0	0	0	0	815	10,667
Sand Springs	9,968	356	56	0	0	0	412	9,556
Smoky	6,483	628	34	0	0	0	662	5,821
Stone Cabin	17,130	1,174	592	0	0	2,700	4,466	12,664
Wagon Johnnie	7,526	1,885	432	0	250	600	3,167	4,359
Willow Creek	476	131	7	0	0	0	138	338
TOTALS	148,458	12,040	2,114	422	250	7,242	22,068	126,390

a/ Available vegetation is determined by the 1979 vegetation allocation procedures; see Appendix A, Section 1.

b/ No AUMs are allocated to livestock; allocations to big game would be made to reasonable numbers where possible, and allocations to wild horses would be to MFP optimum numbers. See Appendix A, Section 1.

c/ The majority of this allotment is located in the Bureau of Land Management, Ely District.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Range Survey files, and Tonopah Management Framework Plan, compiled 1979.

TABLE 1-8
NO LIVESTOCK GRAZING ALTERNATIVE
ESTIMATED FUTURE PRODUCTION AND USE, YEAR 2015 (AUMs)

Allotment	Available Vegetation 2015 a/	Estimated Future Use					Total Used	Total Unused
		Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses		
Blue Eagle	1,920	0	9	29	0	0	38	1,882
Butterfield	4,936	943	26	253	0	0	1,222	3,714
Crater Black Rock	4,345	95	33	0	0	0	128	4,217
Currant Ranch	626	216	0	58	0	0	274	352
Forest Moon	371	295	0	25	0	0	320	51
Francisco	1,393	0	0	0	0	0	0	1,393
Hot Creek	8,915	3,373	0	0	0	0	3,373	5,542
Hunts Canyon	3,730	0	81	0	0	90	171	3,559
Ione	13,739	222	0	0	0	0	222	13,517
Monitor	3,958	69	31	0	0	12	112	3,846
Morey	3,084	2,065	0	0	0	0	2,065	1,019
Nyala	15,429	105	116	93	0	0	314	15,115
Ralston	18,058	94	196	0	0	60	350	17,708
Reveille	38,739	1,142	510	0	0	3,780	5,432	33,307
San Antone	14,353	991	0	0	0	0	991	13,362
Sand Springs	12,460	387	57	0	0	0	444	12,016
Smoky	8,104	785	35	0	0	0	820	7,284
Stone Cabin	21,413	1,468	610	0	0	2,700	4,778	16,635
Wagon Johnnie	9,408	1,885	432	0	250	600	3,167	6,241
Willow Creek	595	131	7	0	0	0	138	457
TOTALS	185,576	14,266	2,143	458	250	7,242	24,359	161,217

a/ The available vegetation potential for the future (year 2015) is based on an increase in production, brought about by no livestock grazing and wild horse reduction to optimum numbers; see Appendix A, Section 1, Table A-2.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Range Survey files, and Tonopah Management Framework Plan, 1979.

TABLE 1-9
LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE
INITIAL ALLOCATIONS (AUMs)

Allotment	Available Vegetation 1979 a/	Proposed Initial Allocations									
		Livestock	Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses	Total Used	Total Unused	Levels of Grazing Mgmt.
Blue Eagle b/	1,536	1,331	0	8	23	0	0	1,362	174	AMP
Butterfield	3,949	633	754	26	235	0	0	1,648	2,301	Non-AMP
Crater Black Rock	3,476	1,075	95	33	0	0	0	1,203	2,273	Non-AMP
Currant Ranch	501	64	173	0	46	0	0	283	218	Non-AMP
Forest Moon c/	297	0	236	0	25	0	0	261	36	No Grazing
Francisco b/	1,114	1,114	0	0	0	0	0	1,114	0	AMP
Hot Creek	7,132	3,719	2,698	0	0	0	0	6,417	715	Non-AMP
Hunts Canyon c/	2,984	2	0	73	0	0	192	267	2,717	No Grazing
Ione b/	10,991	10,056	215	0	0	0	0	10,271	720	AMP
Monitor b/	3,166	2,487	60	31	0	0	12	2,590	576	AMP
Morey	2,467	638	1,652	0	0	0	0	2,290	177	Non-AMP
Nyala	12,343	3,651	105	116	93	0	0	3,965	8,378	Non-AMP
Ralston	14,446	3,627	92	196	0	0	132	4,047	10,399	Non-AMP
Reveille c/	30,991	0	971	510	0	0	11,700	13,181	17,810	No Grazing
San Antone b/	11,482	10,489	815	0	0	0	0	11,304	178	AMP
Sand Springs b/	9,968	6,735	356	56	0	0	0	7,147	2,821	AMP
Smoky b/	6,483	4,175	628	34	0	0	0	4,837	1,646	AMP
Stone Cabin c/	17,130	0	1,174	592	0	0	10,920	12,686	4,444	No Grazing
Wagon Johnnie c/	7,526	0	1,885	432	0	250	792	3,359	4,167	No Grazing
Willow Creek	476	169	131	7	0	0	0	307	169	Non-AMP
TOTALS	148,458	49,965	12,040	2,114	422	250	23,748	88,539	59,919	

a/ Available vegetation is determined by the 1979 vegetation allocation procedures; see Appendix A, Section 1.

b/ These allotments would be placed under intensive grazing management.

c/ These allotments would have no livestock grazing.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Range Survey files, and Tonopah Management Framework Plan, 1979.

TABLE 1-10
LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE--ESTIMATED FUTURE PRODUCTION AND USE, YEAR 2015 (AUMs)

Allotment	Available Vegetation 2015 a/	Estimated Future Use							
		Livestock	Mule Deer	Antelope	Bighorn Sheep	Elk	Wild Horses	Total Used	Total Unused
Blue Eagle	1,669	1,413	0	9	29	0	0	1,451	218
Butterfield	4,778	633	943	26	253	0	0	1,855	2,923
Crater Black Rock	4,076	1,075	95	33	0	0	0	1,203	2,873
Currant Ranch	610	64	216	0	58	0	0	338	272
Forest Moon	371	0	295	0	25	0	0	320	51
Francisco	1,228	1,228	0	0	0	0	0	1,228	0
Hot Creek	7,970	3,719	3,373	0	0	0	0	7,092	878
Hunts Canyon	3,428	2	0	81	0	0	1,230	1,313	2,115
Ione	16,178	10,776	222	0	0	0	0	10,998	5,180
Monitor	4,010	3,187	69	31	0	0	12	3,299	711
Morey	2,924	638	2,065	0	0	0	0	2,703	221
Nyala	14,195	3,651	105	116	93	0	0	3,965	10,230
Ralston	16,780	3,627	94	196	0	0	1,447	5,364	11,416
Reveille	35,282	0	1,142	510	0	0	28,013	29,665	5,617
San Antone	18,025	13,205	991	0	0	0	0	14,196	3,829
Sand Springs	12,777	10,781	387	57	0	0	0	11,225	1,552
Smoky	7,883	5,557	785	35	0	0	0	6,377	1,506
Stone Cabin	20,894	0	1,468	610	0	0	15,417	17,495	3,399
Wagon Johnnie	9,408	0	1,885	432	0	250	2,047	4,614	4,794
Willow Creek	536	169	131	7	0	0	0	307	229
TOTALS	183,022	59,725	14,266	2,143	458	250	48,166	125,008	58,014

a/ The available vegetation for the future (year 2015) is based on increased production brought about by no livestock grazing in big game use areas and through intensive management on seven allotments that would receive less than 40 percent reduction, see Appendix A, Section 1.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Range Survey files, and Tonopah Management Framework Plan, 1979.

LIVESTOCK SUPPORT FACILITIES

Under this alternative, livestock grazing would be reduced from 40 to 100 percent in 13 allotments. No livestock support facilities would be proposed in these allotments. In seven allotments livestock grazing would be reduced less than 40 percent and would receive intensive grazing management. These would be Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky. Livestock support facilities would be proposed in these seven allotments and are summarized in Table 1-11. See Appendix B, Section 2 for a list of livestock support facilities by allotment. Approximate locations of these projects are shown on the Range Facilities and Land Treatments-Proposed Action and Alternatives Map.

GENERAL IMPLEMENTATION SCHEDULE

Livestock reductions would begin after the District Manager's decision. Seven allotments, receiving less than 40 percent reduction, would be put under intensive grazing management (AMPs). These seven allotments would have intensive livestock grazing implemented in a manner similar to that described in the proposed action. Eight of the remaining thirteen allotments would continue under current management (non-AMPs). The final five allotments (Forest Moon, Hunts Canyon, Reveille, Stone Cabin, and Wagon Johnnie) would have no livestock grazing.

Implementation of intensive grazing management in Blue Eagle, Francisco, Ione, Monitor, San Antone, and Smoky allotments would begin after the District Manager's decision. Criteria used to determine the priority of AMP implementation are the same as for the proposed action; see Table 1-5. For analysis purposes, it is assumed that all intensive management would be implemented within seven years (Table 1-12).

STANDARD OPERATING PROCEDURES

INHERENT REQUIREMENTS

Certain requirements are inherent in implementing Federal actions on BLM-administered public lands. These requirements, or Standard Operating Procedures, would be followed in the construction of support facilities necessary for implementation of the proposed action or alternatives.

1) All projects require an environmental assessment on specific sites prior to project implementation. If significant impacts would occur, the project would be modified or abandoned,

2) Permanent roads and trails would not be constructed to project sites. Existing access or off-road travel would be used where needed.

3) For compliance with wilderness directives all proposed projects located in areas under wilderness consideration would be reviewed in accordance with Interim Management Policy (IMP) and Section 603(a) of the Federal Land Policy and Management Act (FLPMA). These reviews would be conducted on a project by project basis, as part of the environmental assessment in number 1 above. Existing "multiple-use" activities, including grazing, may continue; however, new uses can be allowed only if the impacts would not impair the suitability of the area for wilderness.

4) A "threatened" or "endangered" plant or animal species clearance would be required before any part of the proposed action or alternatives were implemented that might affect a threatened or endangered species or its habitat. If any part of the proposal would impact a threatened or endangered species or its habitat, the project impacts would be "mitigated" or the project abandoned if mitigations were not feasible.

5) In order to minimize adverse impacts on cultural resources, BLM will comply with section 106 of the National Historic Preservation Act of 1966, section 2(b) of Executive Order 11593, and section 101(b) (4) of the National Environmental Policy Act (NEPA) of 1969. In accordance with this policy, "cultural resources" clearance would be required for all project sites or actions prior to implementation. "Intensive" surveys would be conducted to locate possible cultural or paleontological sites. If such sites are discovered, the project would be relocated or redesigned. If the project cannot be moved, a mitigative data recovery or "salvage" program would be completed. The BLM, in consultation with the State Historic Preservation Officer, would have final authority on deciding the disposition of the project.

6) All actions would be in compliance with BLM "Visual Resource" Management Design Procedures in BLM Manual 8400. On any project which has a visual contrast rating that exceeds the recommended maximum for the visual

TABLE 1-11
LIVESTOCK SUPPORT FACILITIES
FOR THE LIVESTOCK REDUCTION ALTERNATIVE

Facilities a/	Numbers	Cost/Unit b/	Total Cost
Wells c/	13 ea	8,825 ea	$114,725
Pipelines	58 mi	4,200 mi	243,600
Springs	6 ea	2,300 ea	13,800
Troughs	36 ea	500 ea	18,000
Fences	336 mi	2,300 mi	772,800
Cattleguards	66 ea	1,200 ea	79,200
Subtotal			$1,242,125
Spraying	3,880 ac	8.50 ac	32,980
Seeding	3,880 ac	9.50 ac	36,860
Subtotal			$69,840
Grand Total			$1,311,965

a/ Approximate locations are shown on the Livestock Support Facilities Map (see Appendix B, Section 2 for a list of proposed livestock support facilities by allotment).

b/ Cost per unit includes actual cost and installation and were developed by the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1979.

c/ Wells differ in depth (100-300 feet); therefore, this reflects average unit cost.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Tonopah Unit Resource Analysis and area files, 1976; Nevada State Office, Division of Technical Services, project cost files, 1976.

TABLE 1-12
IMPLEMENTATION SCHEDULE FOR
LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

AMP Allotments	Priority a/
Sand Springs	1
Blue Eagle	2
Ione	3
San Antone	4
Smoky	5
Monitor	6
Francisco	7

a/ Criteria used to determine the priority of AMP implementation are the same as for the proposed action; see Table 1-5. The order of implementation might change.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area, Tonopah Management Framework Plan, 1979.

class zone in which it is proposed, the visual contrast is considered significant and mitigating measures must be examined. The ultimate decision in these cases of whether a particular project's visual impact is positive or negative, acceptable or unacceptable, and whether mitigating measures must be implemented, rests with the District Manager and must be made on a project-by-project basis.

7) Construction of all fences would be in accordance with design constraints in BLM Manual 1737.

8) Clearing vegetation from project sites requiring excavation would be held to a minimum.

9) All disturbed areas which have the capability of producing vegetation would be reseeded with native and/or introduced species as soon as possible to replace ground cover on the sites.

10) Water should be made available in allotments and rested pastures for wild horses and wildlife.

11) Where the need is identified for wildlife use, all water improvements or facilities would contain bird ramps in watering troughs, lateral water sites off pipelines, overflows at troughs, and protected seep areas.

12) "Spring developments" would be fenced to prevent trampling and overgrazing of the adjacent vegetation, to provide escape areas for wildlife, etc.

13) Application of the herbicide 2,4-D on proposed treatment areas to reduce sagebrush would be in accordance with established BLM procedures. Refer to Appendix D for additional guidance (policy, laws, etc.) which would be followed when using chemicals on public lands. After chemical application, the area would be seeded with "desirable plant species."

14) Maintenance of "range improvements" constructed on public lands would comply with BLM Manual 7120. Existing fences and cattleguards built primarily for livestock management would be covered by cooperative agreements with individual livestock permittees. Minor maintenance would be the responsibility of the permittee, while reconstruction or major maintenance would be BLM's responsibility. Maintenance of highway fences damaged by vehicles would be the responsibility of the State Highway Department. BLM controlled water developments including wells, pipelines, wildlife watering devices, storage tanks, catchments, pit tanks, reservoirs, and springs would generally be maintained by BLM. However, with some water developments, such as wells, the BLM would have the well drilled and maintain the below ground facilities and the livestock permittee would maintain the above ground facilities.

15) Alteration of sagebrush areas either through application of herbicides, prescribed burning, or by mechanical means would be in accordance with procedures specified in the Western State's Sage Grouse Guidelines and the Memorandum of Understanding between the Nevada Department of Wildlife and Bureau of Land Management.

MANAGEMENT SUPERVISION PROCEDURE

EVALUATION AND MODIFICATION

An evaluation and monitoring system in the form of resource studies would be utilized to determine the effectiveness of management. Four primary studies are basic in evaluating livestock grazing: actual grazing use, vegetation utilization, range condition and trend, and climatic data (BLM Manual 4413.3). If determined pertinent to the resource values of an allotment, studies would be established to evaluate the effects of the proposed action or alternatives on wildlife habitat, riparian vegetation, aquatic habitat, watershed conditions, wild horse behavior and migration patterns, etc.

Currently, 385 range studies have been established in the Tonopah Resource Area. They were implemented in key areas of each allotment and consist of range trend, utilization, or comparative exclosures. Most of these studies were established in 1977 and 1978. However, some of the exclosures have been in use since 1937. Additional studies would be established if the need arose. Data from these studies would be evaluated to determine the effectiveness of management and to assist in making appropriate management decisions.

ADMINISTRATION

Each range user would be issued term permits through the District Office. These would specify allotment, periods-of-use, numbers, and kind of livestock.

Livestock grazing would be supervised throughout the year. Changes in use requested by the livestock operator, which are outside the limits of the proposed action and are consistent with management objectives, must be requested in writing

and approved in advance of the grazing period. Grazing use outside the limits of the proposal and without prior authorization would be considered trespass. If trespass should occur, action would be taken by BLM to assure that it is eliminated in accordance with regulations in 43 *Code of Federal Regulations* 4150.

In addition, livestock would be marked by ear tagging to monitor movement of livestock and insure proper use.

INTERRELATIONSHIPS

The proposed action and alternatives must be coordinated with existing or proposed private projects and Federal, State, and local governmental programs and policies. The administration of public land resources involves a complex interaction between resource demands and between varying types of stewardship. Besides providing vegetation for wildlife, livestock, and wild horses, the area is helping in meeting the demands for energy, minerals, recreational opportunities, and for national defense.

FEDERAL PROGRAMS

NEVADA BLM

Land use recommendations supporting the preferred alternative were developed through the BLM's planning system (BLM Manuals 1601-1608). Table 1-13 summarizes the Management Framework Plan's (MFP) multiple-use recommendations that interact with the Tonopah Grazing EIS proposed action.

FOREST SERVICE (FS)

Six BLM livestock permittees in the Tonopah Resource Area have grazing authorization within the Toiyabe National Forest and four within the Humboldt National Forest. Generally, these permittees use the national forest from June 1 to September 30. Interagency agreements have been made for the Wagon Johnnie and Willow Creek Allotment Management Plans. Most of the boundaries between the BLM and the FS have not been fenced. As intensive management is planned for Smoky, San Antone, Hunts Canyon, Ralston, Stone Cabin, Nyala, Ione, and Monitor allotments, boundaries with the FS may be fenced or pastures may be combined to implement grazing systems. In addition, wildlife and wild horses utilize both BLM-administered public lands and national forest lands in their normal range. This necessitates close coordination between the two agencies.

FISH AND WILDLIFE SERVICE

Coordination with the Fish and Wildlife Service for clearance on the proposed action or alternatives relating to threatened or endangered plant and animal species is required. They also have jurisdiction over predator control. Predator control has been implemented in areas mainly utilized by sheep operations. However, some recent requests have been in areas of cow-calf operations.

STATE PROGRAMS

NEVADA STATE CLEARINGHOUSE

The Nevada BLM has a memorandum of understanding with the State of Nevada designating the Nevada State Planning Coordinator as the Clearinghouse coordination point for BLM programs with the State. While all programs are coordinated, the three main areas of concern are with the Bureau's planning system, major environmental assessments, and environmental impact statements.

NEVADA DEPARTMENT OF WILDLIFE (NDW)

The Nevada Department of Wildlife (formerly the Department of Fish and Game) is responsible for the management of wildlife populations within the Tonopah Resource Area. The NDW and BLM determine reasonable numbers of big game species (mule deer, antelope, bighorn sheep, and elk). BLM also has a cooperative agreement with the NDW for the management of the Railroad Valley Wildlife Management Area.

NEVADA STATE WATER ENGINEER

Under current State law, the office of the State Water Engineer controls the allocation of water resources within Nevada. Because availability of water is critical to the allocation of vegetation, coordination must be maintained to ensure the availability of water supplies on public lands.

TABLE 1-13
DEVELOPMENT OF THE PROPOSED ACTION
THROUGH THE MFP

MFP STEP I RECOMMENDATIONS FOR LIVESTOCK	OTHER MFP STEP I RECOMMENDATIONS WHICH CONFLICT WITH LIVESTOCK RECOMMENDATIONS	MFP STEP 2 RECOMMENDATIONS	RATIONALE FOR MFP 2 RECOMMENDATIONS	RESOURCE TRADE-OFFS
1. Allocate available vegetation to livestock to maintain the current (1978) authorized use where possible. Utilize the 1959-64 vegetation inventory, as modified (May 1979) to include suitability criteria as a basis of vegetation allocation. Where the grazing capacity is less than current authorized use, the authorized use is to be reduced to the new capacity and the difference placed in suspended nonuse.	1.1 Wildlife--Allocate available vegetation to reasonable numbers of big game (mule deer, antelope, bighorn sheep, and elk) where possible by use area by allotment.	1.1 Allocate available vegetation to reasonable numbers of big game where possible by use area by allotment.	1.1 To help meet the reasonable number demand for big game animals in the resource area, it is necessary to reserve available vegetation to provide for their needs. Some of the required vegetation is located within areas utilized by livestock and wild horses.	1.1 Vegetation allocated to big game would not be available for use by livestock and wild horses
	1.2 Wild Horses--Allocate available vegetation to optimum numbers of wild horses by herd use area in 11 allotments.	1.2 Allocate available vegetation to optimum numbers of wild horses in herd use areas in six allotments.	1.2 It is necessary to reserve available vegetation for wild horses to meet the requirements of the Wild Horse and Burro Act of 1971. Small wild horse herds of less than 20 animals are not considered healthy, self-sustaining, viable herds and should be removed. The demands of sound watershed management preclude the management of wild horses in some existing small herd use areas.	1.2 The total vegetation allocated to wild horses would not be available for use by livestock.
2. Establish a period-of-use for livestock based on phenology of key plant species for each allotment.	2.1 Wildlife--Improve deteriorated aquatic-riparian areas and meadows, through livestock management, fencing, and vegetative treatments.	2.1 Implement grazing systems to meet the physiological requirements of key plant species for each allotment. During the interim period, maintain existing periods-of-use in allotments where studies indicate good range condition and an upward trend. In all other allotments, livestock would be removed during the critical growth period of key plants.	2.1 With the establishment of intensive grazing systems, the physiological requirements of the key plant species would be met during each grazing cycle. During the interim period, if allotments are responding to present management, it would not be necessary to implement more restrictive periods-of-use.	2.1 Riparian and wet meadow areas would continue to receive heavy use during scheduled use periods by livestock and would continually be used by wild horses. However, key plant species would regain some vigor during periods of nonuse by livestock.
3. Continue existing intensive grazing management on two allotments and implement intensive grazing management on the remaining 18 allotments to provide additional vegetation for livestock. Establish a priority for implementation.	3.1 Wildlife--Improve wildlife habitat by implementing livestock management, fencing, and land treatments.	3.1 Continue existing intensive grazing management on two allotments and implement intensive grazing management on 15 allotments.	3.1 Through intensive grazing management, the forage condition would improve over a period of years thus increasing the available vegetation for allocation to livestock, big game, and wild horses. The costs of projects necessary to implement management is not economically reasonable for some allotments.	3.1 Resource recommendations are complementary. No trade-offs would be necessary.
	3.2 Wild Horses--On areas recommended for wild horse management, consider wild horses as the dominant use and maintain their free-roaming behavior. Proposed range improvments should help accomplish objectives of wild horse management.	3.2 Continue existing intensive grazing management on two allotments and implement intensive grazing management on 15 allotments. When developing intensive grazing management in allotments containing wild horses, the free-roaming behavior of wild horses will be a major consideration.	3.2 Intensive grazing management would improve the forage condition and would increase the available vegetation for allocation to livestock, big game, and wild horses.	3.2 Optimum free-roaming conditions of wild horses may not be maintained.
4. Provide additional vegetation for livestock by land treatments and development of water in areas currently over four miles from water.	4.1 Wildlife--Improve wildlife habitat through land treatments such as burning and seeding.	4.1 Provide additional vegetation for livestock and wildlife by land treatments. Develop water for livestock in areas currently over four miles from water.	4.1 Wildlife habitat, in some areas, is in a deteriorated condition. Grazing pressure between livestock and wildlife can be lessened by providing additional vegetation through land treatments. In several allotments, additional vegetation is needed to help meet the demand from livestock, big game, and wild horses.	4.1 Resource recommendations are complementary. No trade-offs would be necessary.
	4.2 Wildlife--Maintain and restore crucial wildlife areas such as sage grouse strutting grounds and brooding areas, key mule deer winter ranges, etc.	4.2 Locate land treatments in areas away from sage grouse strutting grounds and crucial habitat areas.	4.2 Construction of land treatments in crucial habitat areas may limit or destroy crucial wildlife habitat.	4.2 Resource recommendations are complementary.
	4.3 Wild Horses--Reserve water for wild horses in allotments containing use areas.	4.3 Develop water for livestock and wild horses in areas currently over four miles from water.	4.3 Additional water is needed for livestock and wild horses.	4.3 Resource recommendations are complementary.

Source: U.S. Department of the Interior, Bureau of Land Management, Tonopah Resource Area. Management Framework Plan, compiled 1979.

NEVADA DEPARTMENT OF HIGHWAYS

The fencing of pasture and allotment boundaries may occur along highway rights-of-way. When this occurs, coordination with the Nevada Department of Highways is necessary. Agreements are made on an individual project basis usually between the Highway District Engineer and the BLM District Manager. Most fences are constructed on a cost-share basis.

PRIVATE LANDS

Range permittee holdings within the Tonopah Resource Area constitute less than one percent of the total land area for a total of approximately 27,514 acres. Private lands are generally located on major drainages containing permanent streams.

These lands are used primarily for agricultural production in relation to livestock operations. Because of their limited acreage, private lands cannot supply the necessary livestock forage for all seasons of the year. They must be combined with public grazing lands to provide a yearlong operation.

SUMMARY OF ENVIRONMENTAL IMPACTS

The environmental impacts of the proposed action and each alternative as discussed in Chapter 3 are shown in comparative form (Table 1-14). This table outlines the issues and provides a basis for public review and a basis for making a choice among options by the decision maker.

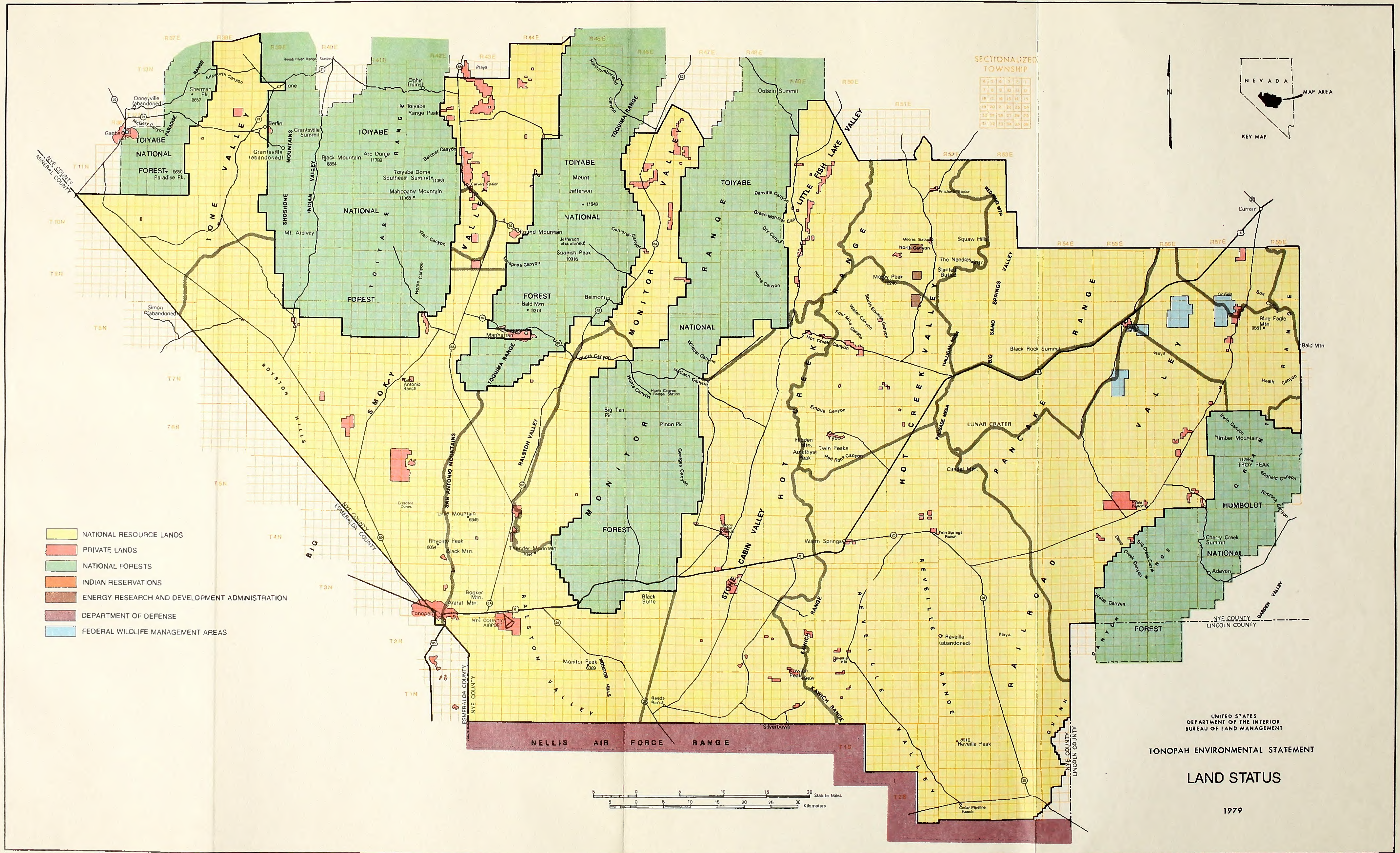
TABLE 1-14
COMPARATIVE IMPACTS OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

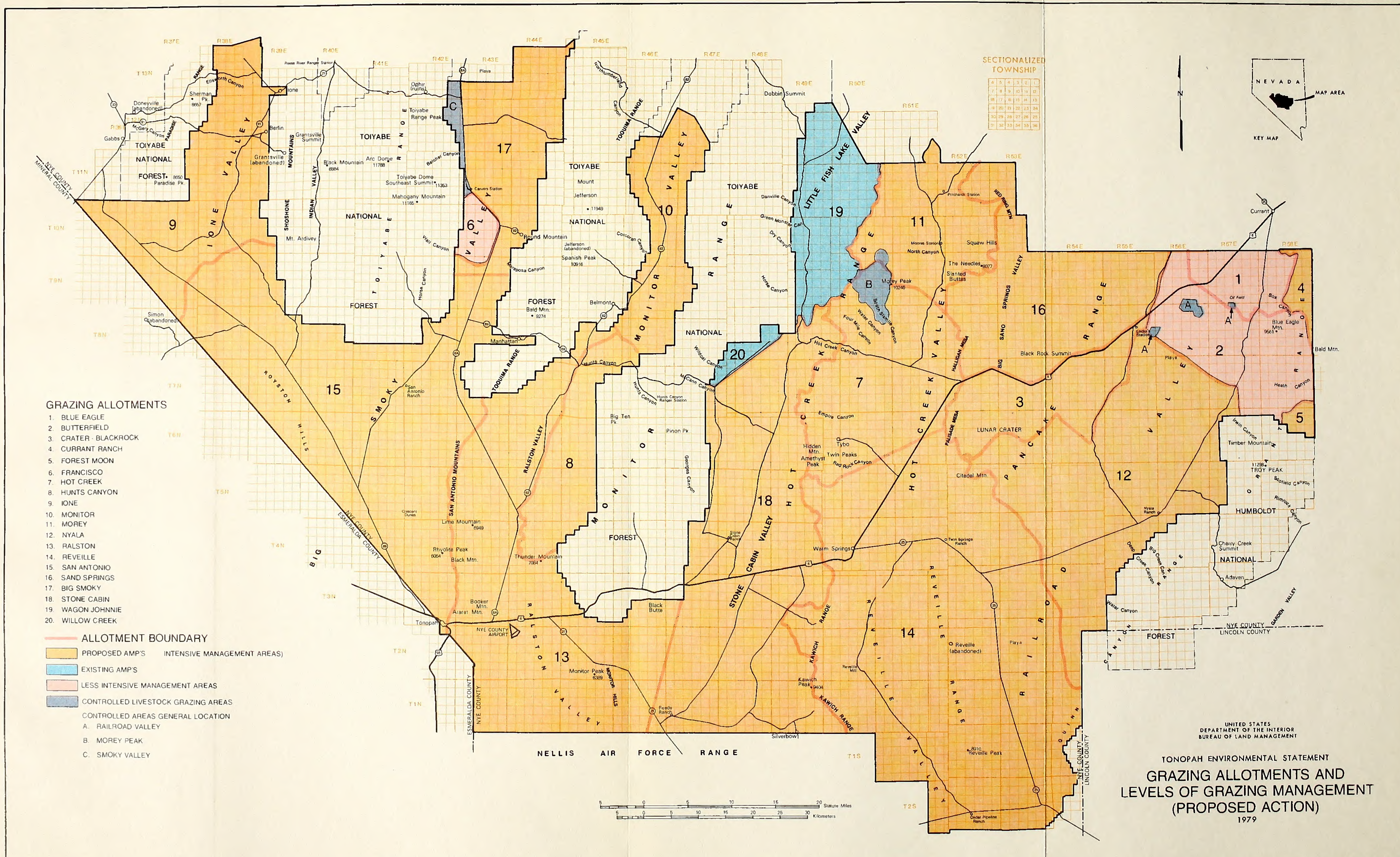
Environmental Component	Existing Situation	Proposed Action	No Action Alternative	No Livestock Grazing Alternative	Livestock Reduction/ Maximizing Wild Horses Alternative
Soils					
Erosion Rate					
(Tons/Acre/Year)					
Resource Area Wide	0.78				
Long-Term		0.65	0.84	0.65	0.76
Proposed Burn	0.66				
Short-Term		0.85	--	--	--
Long-Term		0.59	--	--	--
Proposed Spray	0.82				
Long-Term		0.75	--	--	0.75
Water Resource					
Water Quantity					
(Acre/Feet/Year)	143,000				
Short-Term		No Change	No Change	No Change	No Change
Long-Term		No Change	No Change	No Change	No Change
Water Quality					
Fecal Coliform Standard					
(Percent compliance)	97				
Short-Term		No Change	No Change	100	No Change
Long-Term		No Change	No Change	100	No Change
Turbidity Standards					
(Percent compliance)	92				
Short-Term		No Change	No Change	96	No Change
Long-Term		No Change	No Change	100	No Change
Vegetation					
Livestock Forage					
Condition (acres)					
Good	270,158				
Long-Term		1,133,190	107,566	1,166,716	1,022,788
Fair	1,118,887				
Long-Term		1,534,848	594,104	1,531,563	1,235,865
Poor	2,096,808				
Long-Term		817,815	2,784,183	787,574	1,227,200
Unclassified	189,721				
Long-Term		No Change	No Change	No Change	No Change
Available Vegetation					
(AUMs)	148,458				
Long-Term		184,127	142,914	185,576	183,022
Big Game (numbers)					
Mule Deer	8,425				
Short-Term		9,530	No Change	9,530	9,530
Long-Term		10,410	No Change	10,980	10,980
Antelope	555				
Short-Term		900	No Change	900	900
Long-Term		910	No Change	910	910
Bighorn Sheep	115				
Short-Term		190	No Change	190	190
Long-Term		210	No Change	210	210
Elk	105				
Short-Term		No Change	No Change	No Change	No Change
Long-Term		No Change	No Change	No Change	No Change
Wild Horses					
Productivity (percent)	12.5				
Short-Term		--	--	--	15
Long-Term		15	6.6	15	No Change
Visual Resources					
Change in Visual Rating of land treatment areas					
(by class)	Class II				
Long-Term		Class III	No Change	No Change	Class III
Cultural Resources					
(Sites)	165,000				
Long-Term		698 Impacted	No Change	No Change	219 Impacted
Recreation					
(Hunter Days)	5,400				
Short-Term		6,495	No Change	6,495	6,495
Long-Term		7,314	No Change	7,847	7,847
Livestock Grazing (AUMs)					
(Last Five Year Average Use)	118,941				
Short-Term		126,390	117,706	0	49,965
Long-Term		159,474	117,706	0	59,725
Number of Allotments with AUM Changes					
Increased	0	15	0	0	6
Decreased	0	5	0	20	14
Static	20	0	0	0	0
Calf Crop (present)					
Long-Term	70-73	73- 78	No Change	No Change	70-73 a/
Calf Weaning Weight (pounds)					
Long-Term	350-400	360-420	No Change	No Change	350-420 a/

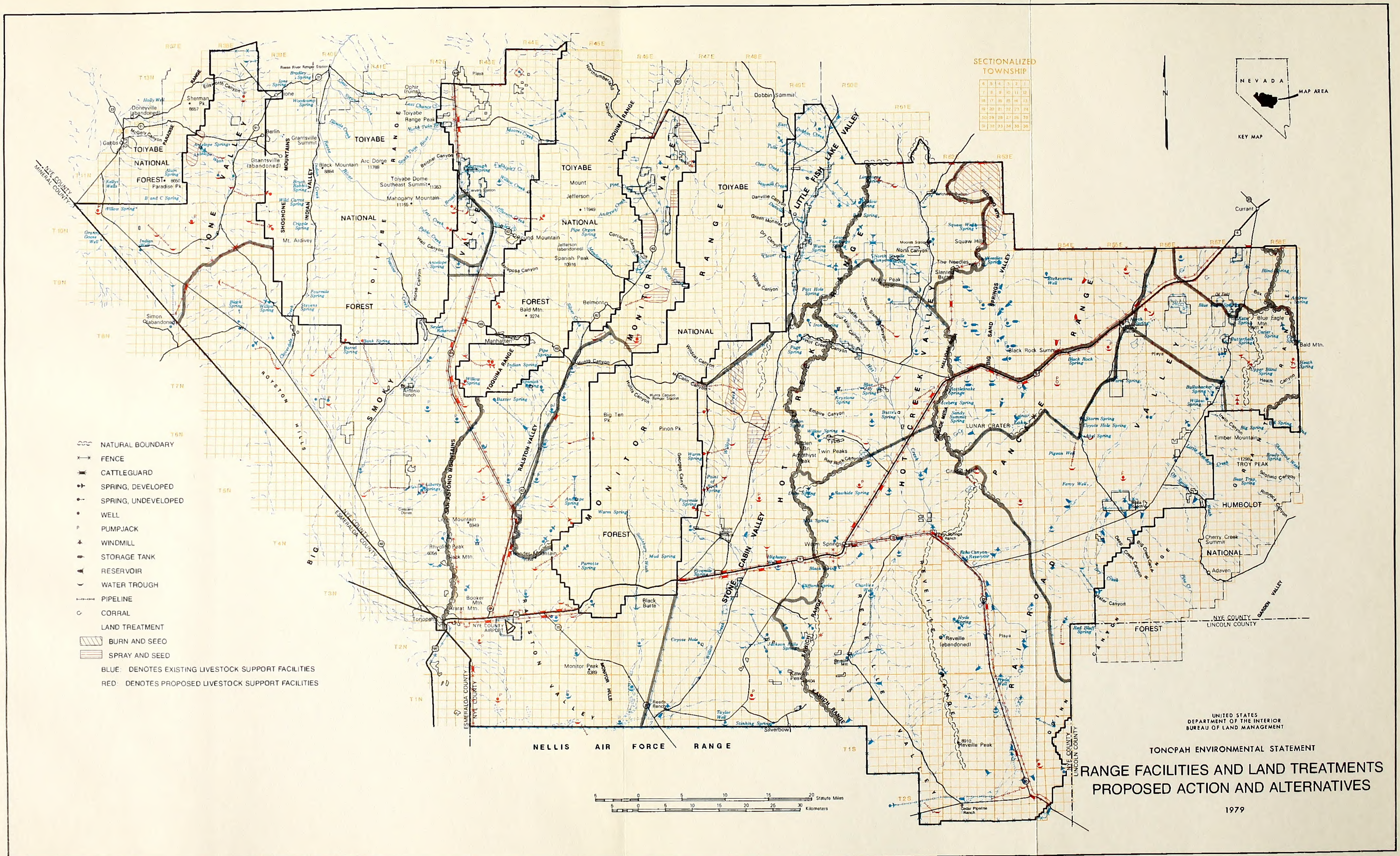
TABLE 1-14 (Continued)
COMPARATIVE IMPACTS OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

Environmental Component	Existing Situation	Proposed Action	No Action Alternative	No Livestock Grazing Alternative	Livestock Reduction/ Maximizing Wild Horses Alternative
Wilderness (Characteristics)	11 Areas designated for further study	No Change	No Change	No Change	No Change
Social-Economics					
Economic Values					
Net Ranch Income ($1,000)	$2,249				
Short-term ($1,000)		1,522	No Change	466	975
Long-term ($1,000)		2,458	No Change	466	1,123
Rancher Wealth	7,156				
Short-term ($1,000)		5,956	No Change	0	2,156
Long-term ($1,000)		7,656	No Change	0	2,656
Regional Income	31,174				
Initial ($1,000)		30,790	No Change	28,942	27,845
Short-term ($1,000)		31,200	No Change	28,950	29,885
Long-term ($1,000)		31,871	No Change	28,961	30,025
Regional Employment	2,871				
Initial		2,864	No Change	2,779	2,814
Short-term		2,881	No Change	2,780	2,823
Long-term		2,909	No Change	2,781	2,831
Social Values					
Ranching Way of Life	Preferred and desirable way of life.	Locally threatened, some ranchers might be required to employ more labor/capital interest/management.	No Change	1) May leave livestock industry and may relocate elsewhere Some ranchers/ ranch hands may be forced into non-agricultural jobs	1) Some may leave livestock industry 2) May force some ranchers into part-time, off-ranch employment
Attitudes	Ranchers held in high esteem	Alienated from Federal Government	1) Sense of relief 2) Range improvements held in abeyance	1) Intense statewide rancher resentment of Federal Government 2) More active support for State seizure of public lands	1) Intense resentment of ranch community toward Federal Government 2) Positive support of many wild horse advocates
Wildlife Interest Group Attitudes	Local & Regional hunters would like to see increases in wildlife populations, especially big game	Wildlife increases supported by local, state, and national groups	Same as existing situation	Those hunters favoring balanced use of public domain would oppose	Same as No Livestock Grazing Alternative
Wild Horse Protectionist Group Attitudes	Some Wild Horse Protectionists feel public domain overtaxed due to excess use by livestock, wild horses, and wildlife. Feel BLM management should strive for balanced use of existing vegetative resources	Balanced use Wild Horse protectionists would support. Other Wild Horse protectionists who feel Wild Horses should have highest forage priority on public domain would oppose	Same as existing situation	Would not be supported by Wild Horse protectionists who favor balanced use of public domain vegetative resources. Other Wild Horse protectionists may support	Same as No Livestock Grazing Alternative
Land Use Decisions	Minimal demand from competing users	Some might sell ranches/small ranches might be acquired by corporate interests	No Change	Most might sell ranch properties	Some might sell property

a/ This increase is only in those seven allotments with intensive management, there would be no change in the other allotments.


NATIONAL RESOURCE LANDS
PRIVATE LANDS
NATIONAL FORESTS
INDIAN RESERVATIONS
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
DEPARTMENT OF DEFENSE
FEDERAL WILDLIFE MANAGEMENT AREAS
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
N
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
IONE VALLEY
SHOSHONE MOUNTAINS
INDIAN VALLEY
TOIYABE RANGE
TOQUIMA RANGE
MONITOR VALLEY
MONITOR RANGE
LITTLE FISH LAKE VALLEY
HOT CREEK RANGE
HOT CREEK VALLEY
SAND SPRINGS VALLEY
PANCAKE RANGE
RAILROAD VALLEY
REVEILLE RANGE
REVEILLE VALLEY
KAWICH RANGE
STONE CABIN VALLEY
RALSTON VALLEY
SAN ANTONIO MOUNTAINS
BIG SMOKY VALLEY
ROYSTON HILLS
QUINN CANYON RANGE
GRANT RANGE
GARDEN VALLEY
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah
Manhattan
Belmont
Round Mountain
Warm Springs
Currant
Lunar Crater
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
LAND STATUS
1979


GRAZING ALLOTMENTS
1. BLUE EAGLE
2. BUTTERFIELD
3. CRATER - BLACKROCK
4. CURRANT RANCH
5. FOREST MOON
6. FRANCISCO
7. HOT CREEK
8. HUNTS CANYON
9. IONE
10. MONITOR
11. MOREY
12. NYALA
13. RALSTON
14. REVEILLE
15. SAN ANTONIO
16. SAND SPRINGS
17. BIG SMOKY
18. STONE CABIN
19. WAGON JOHNNIE
20. WILLOW CREEK
ALLOTMENT BOUNDARY
PROPOSED AMP'S INTENSIVE MANAGEMENT AREAS)
EXISTING AMP'S
LESS INTENSIVE MANAGEMENT AREAS
CONTROLLED LIVESTOCK GRAZING AREAS
CONTROLLED AREAS GENERAL LOCATION
A. RAILROAD VALLEY
B. MOREY PEAK
C. SMOKY VALLEY
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
N
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
IONE VALLEY
SMOKY VALLEY
MONITOR VALLEY
LITTLE FISH LAKE VALLEY
HOT CREEK VALLEY
STONE CABIN VALLEY
RALSTON VALLEY
RAILROAD VALLEY
REVEILLE VALLEY
TOIYABE RANGE
TOQUIMA RANGE
MONITOR RANGE
HOT CREEK RANGE
PANCAKE RANGE
KAWICH RANGE
REVEILLE RANGE
SAN ANTONIO MOUNTAINS
ROYSTON HILLS
BIG SMOKY
Tonopah
Manhattan
Belmont
Warm Springs
Currant
Lunar Crater
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
GRAZING ALLOTMENTS AND
LEVELS OF GRAZING MANAGEMENT
(PROPOSED ACTION)
1979


NATURAL BOUNDARY
FENCE
CATTLEGUARD
SPRING, DEVELOPED
SPRING, UNDEVELOPED
WELL
PUMPJACK
WINDMILL
STORAGE TANK
RESERVOIR
WATER TROUGH
PIPELINE
CORRAL
LAND TREATMENT
BURN AND SEED
SPRAY AND SEED
BLUE: DENOTES EXISTING LIVESTOCK SUPPORT FACILITIES
RED: DENOTES PROPOSED LIVESTOCK SUPPORT FACILITIES
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
N
Statute Miles
Kilometers
NELLIS AIR FORCE RANGE
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
RANGE FACILITIES AND LAND TREATMENTS
PROPOSED ACTION AND ALTERNATIVES
1979

CHAPTER 2

AFFECTED ENVIRONMENT

CHAPTER 2

AFFECTED ENVIRONMENT

INTRODUCTION

The purpose of this chapter is to discuss the environment as it exists today within the Tonopah Resource Area, and to provide a basis on which impacts of the proposed action and alternatives may be assessed. Only those elements of the environment which are determined to be significantly impacted by the proposed action and alternatives are discussed in detail with peripheral environmental data included only to the extent necessary to provide a basis for analysis. This chapter contains the following sections: Climate, Soils, Water Resources, Vegetation, Wildlife, Wild Horses, Visual Resources, Cultural Resources, Recreation Resources, Livestock Grazing, Wilderness Potential, and Social-Economic Values.

CLIMATE

The Tonopah Resource Area's climate is characteristic of the high, cold desert, with highly variable precipitation patterns, extreme variations in daily temperature, and well-developed seasons. The climate is determined by the area's location which is separated from the moist Pacific weather by the Sierra Nevada Range. Its latitude is between 38 and 39 degrees north, and the elevations are mostly over 5,000 feet mean sea level (Houghton et al. 1975).

The resource area has an average of 120 frost free days a year. Evaporation rates average about 55 inches per year. Monthly temperatures and precipitation averages are tabulated in Tables 2-1 and 2-2; see also Average Annual Precipitation Map.

SOILS

Soils data for the Tonopah Resource Area are composed of two "Third Order" and one "Fourth Order" soil surveys covering half of the resource area. See Table 2-3 and Watershed Boundaries Soils Survey Location Map.

The General "Soils Association" Map is made up of data from the above and other sources, and projected over the Tonopah Resource Area, at the subgroup level of soil classification (USDA, SCS, *Soil Taxonomy*, December 1975). The soils and miscellaneous land types have been grouped into general areas, based primarily on land form (topography) and subgroups (a general classification of soil types). The soil associations (map units) were synthesized using the above references and taking into account: climate, landform, and vegetation (Marty Townsend, Bureau of Land Management, personal communication, 1979). The General Soils Association Map shows a pattern of occurrence on specific kinds of landscapes. The information is useful for general planning, but not detailed planning for specific purposes, e.g., "range site" productivity.

EROSION

Erosion is not a major problem in the Tonopah Resource Area. Water erosion is primarily caused by exceptionally large rainstorms. The resulting gullies continue to erode as their sides sluff and are transported with the local rains. About 14 percent (511,000 acres) of the area has high to moderately high potential for water erosion. About six percent (225,000 acres) of the Tonopah Resource Area has a high potential for wind erosion. The remaining 80 percent (2,880,733 acres) of the area has a moderate to slight erosion potential.

Present erosion in the Tonopah Resource Area for all types of erosion is as follows:

Critical	31,918 acres	1 percent
Moderate	766,777 acres	21 percent
Slight	2,554,577 acres	70 percent
Stable	200,304 acres	6 percent
Unclassified	63,151 acres	2 percent

The current average soil loss is 0.78 tons per acre per year; the maximum soil loss (1.33 tons per acre per year) being on Monitor site 5 (Table 3-1) and the minimum soil loss being about zero.

Chapter 3, "Phase I Watershed" Conservation and Development Inventory is the data base used

TABLE 2-1
AVERAGE PRECIPITATION (inclusive) 1964-1978
(inches)

January	.40	July	.67
February	.78	August	.83
March	.46	September	.78
April	.68	October	.56
May	.66	November	.55
June	.84	December	.60
		TOTAL	7.81

Stations: Currant Highway Station, Duckwater, Smoky Valley, Snowball Ranch, and Tonopah.

Source: U.S. Department of Commerce, "Climatological Data" published monthly by National Oceanic and Atmospheric Administration Environmental Data and Information Service, National Climate Center, Ashville, N.C. 28801. Compiled in 1979.

TABLE 2-2
AVERAGE MONTHLY TEMPERATURE (inclusive) 1964-1978
(Degrees F)

	Maximum	Minimum		Maximum	Minimum
January	42	15	July	89	51
February	46	17	August	86	50
March	53	23	September	78	41
April	59	28	October	67	33
May	71	38	November	52	24
June	79	44	December	42	15

Stations: Currant Highway Station, Duckwater, Smoky Valley, Snowball Ranch, and Tonopah.

Source: U.S. Department of Commerce, "Climatological Data" published monthly by National Oceanic and Atmospheric Administration Environmental Data and Information Service, National Climate Center, Ashville, N.C. 28801. Compiled in 1979.

TABLE 2-3
SOIL SURVEY DATA

Survey Name	Type of Survey	Acres	Percent of Area
Smoky Valley	Third Order	469,760	13
Block Survey	Third Order	296,386	8
Railroad Valley	Fourth Order	1,013,000	28
TOTAL		1,779,146	49

Source: U.S Department of Agriculture, Soil Conservation Service, Reno, Nevada, in cooperation with the University of Nevada, Agricultural Experiment Station, Reno, Nevada, Soil Survey of Big Smoky Valley Area, Nevada, Part of Nye County, by David M. Candland. 1974.

TABLE 2-4
LIVESTOCK WATER DEMAND a/
(acre feet)

Allotment	Surface Water	Groundwater
Blue Eagle	1.2	.66
Butterfield	4.4	.00
Crater Black Rock	4.94	.33
Currant Ranch	.26	.00
Forest Moon	.23	.00
Francisco	.87	.33
Hot Creek	7.15	1.0
Hunts Canyon	2.11	1.33
Ione	8.60	1.33
Monitor	3.36	.33
Morey	2.07	.00
Nyala	13.8	1.0
Ralston	9.20	4.33
Reveille	17.36	6.33
San Antone	9.50	2.66
Sand Springs	6.59	3.33
Smoky	4.70	.66
Stone Cabin	12.37	1.66
Wagon Johnnie	3.01	1.0
Willow Creek	.31	.00
TOTALS	112.03	26.28

a/ Based on 10 gallons/day/cow.

Source: Based on 10 gallons/day/cow from Stoddart, Smith, and Box 1975, and 1978-79 licensed use in the Tonopah Resource Area from Tonopah Range files.

for erosion. The procedure followed for the inventory is explained in Appendix E, Section 1.

See the Present Watershed Erosion Condition Map for the location of the "erosion condition classes" by allotment. For erosion condition by allotment and acreage for each erosion class see Appendix E, Section 2, Table E-1.

All computation of soil loss used the "Pacific Southwest Inter-Agency Committee" (PSIAC) method (Appendix E, Section 3).

WATER RESOURCES

SURFACE WATER

The Tonopah Resource Area has little surface water. Springs are scarce and most streams flow only during the spring melt or after summer rainstorms. The public lands drainage is internal: the water evaporates, is used by plants, or seeps down to recharge the groundwater table. Twelve perennial streams totaling 20.7 miles have an environment suitable for fish. With the exception of South Six-Mile Creek (seven miles long), which is fenced, all remaining streams originate and run for about 90 percent of their length on Forest Service land.

Little Fish Lake Valley has the only permanent natural lake in the Tonopah Resource Area. It covers about 80 acres and has a storage of approximately 160 acre feet.

WATER QUANTITY

Because there are few stream flow gauges within the Tonopah Resource Area, surface water quantity cannot be determined, however, the public lands average eight inches of precipitation a year, which computes to 142,900 acre feet of water annually for the area (Nevada State Engineers Office, 1971). Livestock water demand is shown in Table 2-4.

Groundwater recharge is an estimated 123,400 acre feet annually. Annual use is about 15,570 acre feet and most of this is used for irrigation (USDI, BLM, Tonopah URA, 1975). The Nevada State Water Engineer has listed Stone Cabin Valley and the Tonopah Flat in southern Big Smoky Valley as "designated groundwater basins." The northern part of Big Smoky Valley, Hot Creek Valley, and Railroad Valley are being evaluated for possible listing as designated groundwater basins.

WATER QUALITY

Reliable scientific data on water quality are limited for the Tonopah Resource Area. In October 1976, a water quality survey was conducted on 36 waters, with one sample per station being taken. Most of the water on public lands is suitable for wildlife and livestock (observations by field personnel). Sediment is a problem, but has not been quantified.

VEGETATION

INTRODUCTION

The Tonopah Resource Area is typical of the Basin and Range Province where soils, topography, climate, and vegetation combine to produce ecological zones ranging from high mountain areas to desert lowlands (Fenneman 1931). Similarly, sequences of "vegetation types" occur with the change of ecological zones between the valley bottoms and higher elevations. Vegetation varies from scattered salt tolerant shrubs and grasses, such as greasewood and salt grass around desert playas, through many varieties of desert shrubs, grasses, and forbs to scattered stands of pinyon, juniper, and mountain mahogany on the intermediate and high mountains.

VEGETATION TYPES

The Tonopah Resource Area contains 15 broad vegetative types which are summarized in Table 2-5. These vegetative types, as depicted on the Vegetation Types Map, were typed by "aspect" in accordance with BLM's Phase I Watershed Conservation and Development Inventory Procedures (Appendix E, Section 1).

These types reflect aspect, not composition. (Acreage, percent of resource area, and major species composition of each type are listed in Appendix F, Section 2, Tables F-1 and F-2.) A narrative description of each type follows:

SHADSCALE

Shadscale is the most widespread type, occupying about 795,552 acres (22 percent) of the Tonopah Resource Area. This type is generally found below an elevation of 6,500 feet on lower fans and

TABLE 2-5
SUMMARY OF VEGETATION TYPES

Subtype	Code	Acres	Percentage of Resource Area
Midgrass	011	19,087	1
Bunchgrass	012	59,691	2
Saltgrass	013	1,946	<1
Perennial Forbs	031	4,250	<1
Annual Forbs	183	2,245	<1
Big Sagebrush	041	276,701	8
Black & Low Sagebrush	043	586,290	16
Rabbitbrush	045	166,454	5
Mountain Mahogany	056	8,936	<1
Pinyon-Juniper	091	488,435	13
Shadscale	131	795,552	22
Fourwing Saltbush	134	70,792	2
Greasewood	141	777,284	21
Winterfat	151	62,449	2
Horsebrush	164	187,275	5
Other [a]	07	109,346	3
TOTAL		3,616,733	100

a/ Includes dry lakes, saline flats, sand dunes, and lava flows.

Source: U.S. Department of the Interior, Bureau of Land Management's Phase I Watershed Conservation and Development Inventory, 1971-74.

terraces where annual precipitation is four to six inches. Associated plants are budsage, horsebrush, Galleta grass, and Indian ricegrass.

GREASEWOOD

The greasewood type is the second most common type, occupying about 777,284 acres (21 percent) of the Tonopah Resource Area. This type can be broken down into black greasewood and Bailey greasewood. The Bailey greasewood type occurs in areas generally higher in elevation. It receives slightly more precipitation and requires a deeper soil or lack of a restrictive layer, such as hardpan.

Bailey greasewood is associated with shadscale, bud sagebrush, Galleta grass, Indian ricegrass, and squirreltail, while black greasewood is associated with dalea, shadscale, horsebrush, and saltgrass.

BLACK SAGEBRUSH AND LOW SAGEBRUSH

This type occupies about 586,290 acres (16 percent) of the resource area. It occurs where the soils are moderately deep and well drained. It is prevalent below the pinyon-juniper type and usually between elevations of 6,000 and 7,500 feet with eight to ten inches of precipitation. Associated plants are Galleta grass, Indian ricegrass, needle-and-thread, rabbitbrush, and big sagebrush. Big sagebrush is occasionally prominent in the draws.

PINYON-JUNIPER

This type covers approximately 488,435 acres (13 percent) of the resource area. It is found most often above an elevation of 6,500 feet in the 10 to 14 inch precipitation zone, on gently sloping (four percent) to steep (50 percent) mountain slopes. The soils are generally stony. Pinyon-juniper mostly occurs on south and west facing slopes. This type is associated with big sagebrush, bitterbrush, needle-and-thread, black sagebrush, Sandberg bluegrass, squirreltail, and Indian ricegrass.

BIG SAGEBRUSH

The big sagebrush type covers about 276,701 acres (eight percent) of the resource area and is primarily found from 4,600 to 7,500 feet. It occurs in a wide range of precipitation. Although this type can be found in a variety of areas, it is most prominent on slopes from 6,500 to 7,500 feet in elevations with eight to ten inches of precipitation. Associated plants are fourwing saltbush, rabbitbrush, black sagebrush, Indian ricegrass, and basin wildrye.

HORSEBRUSH

This vegetative type covers about 187,275 acres (five percent) of the resource area. Horsebrush is most common in Railroad Valley southeast of Lunar Crater on low hills in the 5,200 to 6,500 foot elevations. Associated plants are greasewood, shadscale, spiny hopsage, ephedra, and Galleta grass.

RABBITBRUSH

Although this type occupies about 166,454 acres (five percent) of the resource area, it normally would not be found as a specific type as it occurs in the resource area. It is most prominent as a type in the Stone Cabin and Hot Creek Valleys. It occurs where the soils are moderately to strongly saline-alkaline. Associated plants are shadscale, greasewood, Galleta grass, alkali sacaton, and saltgrass. Where it occurs as dominant it is considered an invader plant which has increased due to disturbance such as grazing, fire, erosion, etc.

FOURWING SALTBUSH

This type covers about 70,792 acres (two percent) of the resource area and occurs between elevations of 4,800 to 6,000 feet. It is found mostly on alluvial fans in association with winterfat, shadscale, bud sagebrush, Indian ricegrass, and Galleta grass. This type is prevalent where Ralston Valley and Stone Cabin Valley meet at Monitor Peak.

WINTERFAT

This type occupies about 62,449 acres (two percent) in the resource area. It occurs along moderately sloping fans and drainages. Although this type occurs in small patches throughout the resource area, it is most conspicuous in Ralston Valley and along Hot Creek. Associated plants are rabbitbrush, shadscale, bud sagebrush, Indian ricegrass, big sagebrush, and Galleta grass.

BUNCHGRASS

All the grass types have been broken into three types by dominant grass species. The bunchgrass type is used to depict those areas where crested wheatgrass has been seeded, and the remaining

areas are sand dropseed, Indian ricegrass types. The crested wheatgrass seedings are in Fish Lake Valley and Monitor Valley. The seedings in Monitor were completed from 1962-1968 on 16,000 acres while the seedings in Fish Lake Valley were completed from 1971-1974 on 3,500 acres. This type is represented by 59,691 acres (two percent).

MIDGRASS

Although this type is called midgrass, it is really a bunchgrass-sod-grass type containing mostly Galleta grass and Indian ricegrass. The names were used to separate the crested wheatgrass, sand dropseed area from the Galleta grass, Indian ricegrass types. The major plants found in this type are shadscale, greasewood, fourwing saltbush, and some winterfat. This type is represented by 19,087 acres (one percent).

MOUNTAIN MAHOGANY

This type occupies only one area large enough to be aspect typed. It occupies about 8,936 acres (less than one percent) and occurs on the Pancake Range north of U.S. Highway 6. Associated plants are western wheatgrass, spiny hopsage, and black sagebrush.

ANNUAL FORBS

This type covers about 2,245 acres (less than one percent) of the resource area. Some 97 percent of the composition of this type is halogeton (*Halogeton glomerata*). This type, as in the rabbitbrush type, should not be considered a true type but a type developed due to some disturbance. Unlike rabbitbrush, however, one should not consider halogeton as a part of any type although it can probably never be eradicated.

PERENNIAL FORBS

This type occupies about 4,250 acres (less than one percent) of the resource area. The biggest area is at the mouth of the Northumberland Canyon in Monitor Valley. The major plant species is globemallow in association with rabbitbrush and halogeton.

SALTGRASS

This type occupies about 1,946 acres (less than one percent) of the resource area. The major grasses are saltgrass and alkali sacaton. It occurs in wet areas where soils are alkaline. One major area occurs in Big Smoky Valley around Darrough Hot Springs. However, it does occur in other areas, such as Fish Lake Valley.

RIPARIAN VEGETATION

Riparian vegetation covers less than one tenth of one percent of the Tonopah Resource Area. Being associated mainly with perennial waters, riparian vegetation covers too small an area to be delineated on the Vegetation Types Map. The resource area has one lake, 20.7 miles of perennial streams, 1,000 acres of wetland, and numerous springs for a total of approximately 2,000 acres of riparian vegetation. Although these riparian areas cover a small part of the resource area they are invaluable to wildlife, wild horses, and livestock for water, cover, and forage.

PHENOLOGY

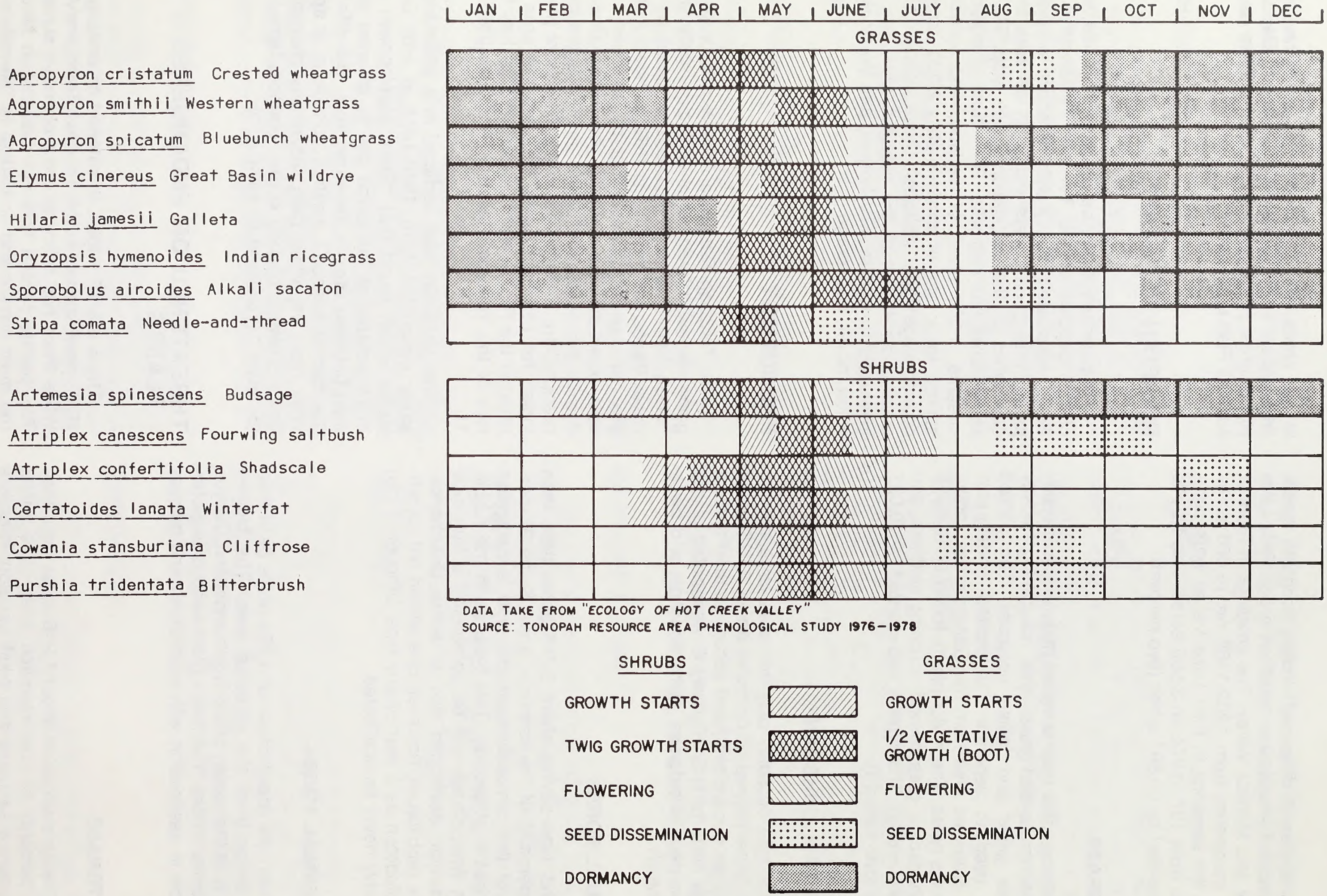
The Tonopah Resource Area is part of an ongoing statewide five year phenological study. Information from a preliminary report prepared by National Resource Consultants (NRC) shows a three year average of phenological development. This data varied substantially from year-to-year probably due to the fluctuation in the amount and time of precipitation. A three year average of plant phenologies for key species in the resource area are listed in the Figure, Plant Phenologies for Key Species of the Tonopah Resource Area (Illustration 2-1).

This variability also surfaced in a phenological study conducted from 1970-1974 in Hot Creek Valley which found that "Plant development was more variable at the same site in different years than between sites in the same year. The effect of the current season's weather conditions is apparently more important than site quality characteristics in initiating change in the "phenodynamics" of the plant," (Tueller et al. 1974, p. 9).

THREATENED OR ENDANGERED PLANTS

There are 16 known threatened or endangered (T/E) plant species in the Tonopah Resource Area. While there has been no comprehensive survey of T/E plants, several lists are available in Nevada; the most current and up-to-date is "Nevada's T/E

PLANT PHENOLOGY FOR KEY SPECIES OF THE TONOPAH RESOURCE AREA



NOTE: THIS GRAPH SHOWS ONLY THOSE KEY SPECIES WITH AVAILABLE PHENOLOGY DATA.

Plant Map Book" (Pinzel 1978). This publication was used to compile a T/E map showing confirmed and approximate locations in the resource area (Perennial Streams and Threatened or Endangered Plant Map). A species list is found in Table 2-6. A consultation request with the Fish and Wildlife Service has been made concerning T/E species.

LIVESTOCK FORAGE CONDITION

Livestock forage condition is the current state of health of the range based on the amount of vegetation it is capable of producing for domestic livestock and/or wild horses and burros under a multiple-use philosophy. Livestock forage condition must not be confused with "ecological range condition" because it is not an ecological rating of "climax," but a measure of the ability of the vegetation to provide "sustained yield" of high quality forage for different kinds of livestock and wild horses.

Livestock forage condition was developed in accordance with BLM Manual 4412 and Instruction Memorandum W.O. 75-42 from information gathered in the BLM's Phase I Watershed Conservation and Development Inventory. Methodology for determining livestock forage condition and a description of each condition class is found in Appendix G, Section 1. Livestock forage condition is shown on the Livestock Forage Condition Map. Acreage for each condition class is found in Table 2-7 (acreage by allotment is shown in Appendix G, Section 1, Table G-1.)

APPARENT RANGE TREND

Range trend is the direction of change in range condition. Two hundred and two "trend plots" were established in "key areas" within each allotment in the Tonopah Resource Area during the summer of 1977 and the summer of 1979. Range trend is developed from data collected over a period of years. The two years of available data in the Tonopah Resource Area are not sufficient to develop range trend; therefore, "apparent range trend" will be used for the purposes of this EIS. Apparent range trend data was collected at each key area at the time the trend plots were established. Observations consider the vigor of desirable forage species, the quantity of new seedlings established by desirable forage species, the apparent movement of surface litter, and the degree of erosion as viewed in terms of gully formation. Methodologies for determining apparent range trend are found in Appendix G, Section 2.

The apparent range trend information may not coincide with the present livestock forage condition or the proposed livestock adjustments in all allotments. Apparent trend information represents only a single year's observations, therefore, it may or may not reflect the actual long-term trend of an area. It was obtained and used for analytical purposes only. Information obtained from apparent range trend shows 41 percent (1,483,805 acres) of the public land in an upward trend, 57 percent (2,071,452 acres) with no apparent trend, and two percent (61,476 acres) in downward trend. Apparent range trend for each allotment is shown in Appendix G, Section 2, Table G-2, and on the Apparent Range Trend Map.

Other trend data is available on portions of the Tonopah Resource Area. In 1937-38, 28 paired plots (one fenced; the other, unfenced) were established in Nevada and Utah on range considered to be heavily grazed at that time. These were built as a cooperative study by the Intermountain Forest Service Experiment Station and the University of Nevada at Reno. Two of these four acre exclosures are located in the resource area in the Hot Creek Valley near Warm Springs. Data were collected in 1942, 1946, 1959, and 1975. These two plots are six miles apart and showed different results. One plot, being close to water, demonstrated a continued downward trend outside the plot and an upward trend inside. The other plot, being approximately three miles from water, showed an upward trend both inside and outside the plot (Holmgren, USDA, Forest Service, personal communication, 1979).

If these two plots are indeed representative of the resource area it could be concluded that areas close to water and areas where cattle congregate are continuing to decline; whereas the greater percent of the area which is away from the water and cattle congregation is slowly improving or remaining static. This conclusion seems to bear out what was found during the summer of 1977 from the apparent trend data. This recovery is probably due to a decrease in livestock numbers as a result of trespass control; however, slowness of this recovery is probably a result of continued yearlong use.

STUDIES

Range studies will become increasingly significant to management as a basis for changes in authorized use. In addition to the trend and phenological studies already mentioned, other studies have been established. During the spring of 1978, 157 "utilization cages" were established in the Tonopah Resource Area. Utilization cages are moved

TABLE 2-6
THREATENED OR ENDANGERED PLANTS

Scientific Name	Common Name	Tenative Status a/	Location b/
Asclepias eastwoodiana		T	V
Astragalus callithrix	Callaway milkvetch	T	V
Astragalus funereus	Funeral milkvetch	T	G
Astragalus pseudiodanthus	Tonopah milkvetch	T	V
Astragalus serenoi var. sordescens	Filthy milkvetch	T	V
Astragalus toquimanus	Toquima milkvitch	T	V
Astragalus uncialis	Currant milkvitch	E	G
Coryphantha vivpara var. rosea		T	V
Cryptantha hoffmannii	Hoffmans cryptantha	T	G
Frasera pahtensis		T	V
Lewisia maguirei	Maguire lewisia	E	V
Machaeranthera leucanthemifolia	Whiteflower machaeranthera	E	G
Penstemon arenarius	Dune penstemon	T	G
Penstemon pudicus		T	G
Sclerocactus polyancistrus		T	G
Sphaeralcea caespitosa	Tuffed globemallow	T	G

a/ T: Threatened
E: Endangered

b/ V: Actual location of plant has been verified in the field.
G: General location of plant has been identified.

Source: Ann Pinzel, editor. "Nevada T/E Plant Map Book," T/E Workshop, Reno, Nevada, February 1978, Carson City, Nevada: Nevada State Musuem, December 1978.

TABLE 2-7
SUMMARY OF LIVESTOCK FORAGE CONDITION (Acres) a/

Condition Class				
Good	Fair	Poor	Unclassified b/	Total c/
221,082	1,140,153	2,143,800	170,539	3,675,574

a/ Livestock forage condition is shown by allotment in Appendix G, Section 1, Table G-1.

b/ Includes dry lakes, sand dunes, lava flows, and private land.

c/ Includes private and public lands.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area Unit Resource Analysis, 1976.

at the end of each grazing period after the current year's growth has been read at each site. Also, during the summer of 1978, 10 one-acre exclosures were constructed. In time, these exclosures along with several others already established in the resource area, will help to show changes in trend and potential productivity for the site. A total of 23 exclosures are contained in the resource area. They range in size from 1 to 10 acres. Except for the 10 established in 1978, most of the exclosures were established in cooperation with other groups such as Fish and Wildlife Service, University of Nevada at Reno, and the Forest Service Experiment Stations. These exclosures will supply range data to BLM and varying types of data to other groups. All of the above studies are shown on the Range Studies Map.

EXISTING ALLOTMENT MANAGEMENT PLANS

Two allotments, Wagon Johnnie and Willow Creek, are currently managed under existing Allotment Management Plans (AMPs). An analysis of the two AMPs is inconclusive about changes in vegetative production, plant cover, and vegetation composition because of the short time they have been implemented and the limited numbers of AMPs. Wagon Johnnie has been implemented 10 years (1970) and Willow Creek four years (1976).

Wagon Johnnie is the only AMP which has shown much of a change and this was primarily in plant cover. There appears to be a strong correlation between plant cover and precipitation. The greatest increase in cover is from litter. Two plots were established in each vegetation type found in the Wagon Johnnie allotment. Increases for the ten year period are as follows: winterfat-40 percent (litter-22 percent), bunchgrass-10 percent (litter-0 percent), big sagebrush-34 percent (litter-24 percent), crested wheatgrass seeding-10 percent (litter-2 percent), saltgrass-54 percent (litter-2 percent), and pinyon-juniper-11 percent (litter-2 percent).

In all vegetation types there is a change in species composition toward the more desirable species; however, this change is slow especially in the big sagebrush and pinyon-juniper types. It is anticipated that Wagon Johnnie and Willow Creek allotments will have the same potential as the other allotments with implementation of the proposed action.

WILDLIFE

INTRODUCTION

The Tonopah Resource Area contains important wildlife habitat for over 300 species of vertebrates. A list of significant species is available at the Battle Mountain and Tonopah BLM Offices.

The public lands support 15 general vegetation types which provide food and cover for wildlife. These types are discussed in more detail in the Vegetation section of Chapter 2.

The bulk of available information relates to life history and habitat requirements of the game animals, especially the large grazing species such as mule deer, pronghorn antelope, elk, and bighorn sheep. Specific wildlife research in central Nevada has been limited. The majority of data and observations on wildlife populations come from the continuing and past efforts of the Nevada Department of Wildlife (NDW). For the purpose of this discussion only those species that are expected to be significantly affected by the proposed action and alternatives will be discussed.

BIG GAME

Mule deer, pronghorn antelope, bighorn sheep, and elk are the big game animals present in the resource area. The various grazing animals tend to separate themselves naturally on summer and winter ranges with some seasonal overlap. However, each of the animals exhibit specific grazing preferences which are reinforced by the palatability and availability of forage at different seasons. In some situations the same forage plants may be preferred by different grazing animals and in such cases where these plants make up the bulk of the diet for one or more species, competition may be high. Competition may be intensified by poor range conditions which result in selection of alternative or less preferred plants and increases utilization because of limited availability or absence of customary feed.

Table 2-8 shows a diet comparison among horses, cattle, antelope, and mule deer as analyzed from droppings at different seasons and from rumen samples from mule deer.

Table 2-9 shows the estimated populations of big game by allotment, "periods-of-use," population trend, and existing conflicts.

TABLE 2-8
SEASONAL DIET COMPOSITION (Percentage)

	Spring a/	Summer a/	Fall a/	Winter a/
Wild Horses b/				
Grasses	90.14	88.6	11.95	19.28
Browse	8.75	10.8	87.83	78.13
Forbs	1.11	0.6	0.22	2.59
Cattle c/				
Grasses	47.2	84.71	6.2	16.2
Browse	52.8	12.12	93.7	83.8
Forbs	0	3.17 b/	.1	0
Domestic Sheep b/				
Grasses			0.96	5.5
Browse	(Fall & Winter Use Only)		98.63	93.42
Forbs			0.41	1.08
Antelope b/				
Grasses	0.23	4.62	0.0	0.06
Browse	18.03	50.65	96.37	13.35
Forbs	81.74	44.73	3.63	86.59
Mule Deer d/				
Grasses	5.5	1.8	0.0	0.2
Browse	85.5	34.2	73.6	99.3
Forbs	9.0	64.0	26.4	0.5

a/ Seasonal periods are: Spring, March 1 to May 30; Summer, June 1 to August 30; Fall, September 1 to November 30; and Winter, December 1 to February 28.

b/ U.S. Department of the Interior, Bureau of Land Management, Ely District. Fecal Analysis Studies in the Duckwater Area, 1975-1976.

c/ J.M. Connor, V.R. Bohman, A.L. Lesperance, and F.E. Kinsinger, "Nutritive Evaluation of Summer Range Forage with Cattle" in Journal of Animal Science, vol. 22, no. 4 (November 1963, reprint).

d/ Larry Arthur Doughty. "Food Habits and Nutrition of Mule Deer (Odocoileus hemionus hemionus Rafinesque) on Four Nevada Ranges," Nevada Cooperative Wildlife Research. 1966, pp. 28-29.

TABLE 2-9
EXISTING STATUS OF BIG GAME

Allotment	Species	Estimated Number [a]	Habitat Area [b]	Periods-of-Use [c]	Population Trend [d]	Existing Conflicts [e]
Blue Eagle	Antelope	0-10	AY-4	1/1-12/31 (12mo)	Static	Poor forage availability
	Bighorn Sheep	10-20	BH-2	1/1-12/31 (12mo)	Static to Down	Livestock winter competition, poor forage availability
Butterfield	Mule Deer	600-610	DW-9	11/1-3/30 (5mo)	Up	Limited winter and summer forage available
			DW-8			
			DW-7	11/1-3/30 (5mo)		
			DS-5	4/1-10/31 (7mo)		
	Antelope	0-10	AY-4	1/1-12/31 (12mo)	Static	Limited forbs
	Bighorn Sheep	50-60	BH-2	1/1-12/31 (12mo)	Static to Down	Poor forage composition, livestock competition
Crater Black Rock	Mule Deer	40-50	DW-16	11/1-3/31 (5mo)	Up	Limited winter range
	Antelope	0-10	AY-4	1/1-12/31 (12mo)	Static	Limited forage and water
Currant Ranch	Mule Deer	140-150	DW-9	11/1-3/30 (5mo)	Up	Limited winter forage available
	Bighorn Sheep	10-20	BH-2	1/1-12/31 (12mo)	Static to Down	Livestock winter competition, poor forage availability
Forest Moon	Mule Deer	170-180	DW-9	11/1-3/30 (5mo)	Up	Limited forage supply
			DW-7	11/1-3/30 (5mo)		
			DS-5	4/1-10/31 (7mo)		
	Bighorn Sheep	0-10	BH-2	1/1-12/31 (12mo)	Static to Down	Poor species composition, livestock competition
Hot Creek	Mule Deer	1,880-1,890	DW-16	11/1-3/31 (5mo)	Up	Winter range composition poor, competition with livestock for browse
			DW-12	11/1-3/31 (5mo)		Summer range composition poor
			DW-9	11/1-3/31 (5mo)		
			DW-11	11/1-3/31 (5mo)		
			DKW-9	11/1-3/31 (5mo)		
			DKW-13	11/1-3/31 (5mo)		
			DS-7	4/1-10/31 (7mo)		
Hunts Canyon	Antelope	20-30	AY-1	1/1-12/31 (12mo)	Static	Limited forb supply and water distribution
Ione	Mule Deer	80-90	DW-2	11/1-4/30 (6mo)	Up	Poor species composition on winter and summer ranges
			DW-3	11/1-4/30 (6mo)		
			DS-2	5/1-10/31 (6mo)		
Monitor	Mule Deer	30-40	DW-3	11/1-3/31 (5mo)	Up	Limited browse available
	Antelope	0-10	AY-1	1/1-12/31 (12mo)	Static	Limited forbs
Morey	Mule Deer	1,820-1,830	DW-11	11/1-3/31 (5mo)	Static to Up	Poor species composition on winter and summer ranges
			DW-12	11/1-3/31 (5mo)		Competition with livestock for forage
			DK-13	11/1-3/31 (5mo)		
			DS-7	4/1-10/31 (7mo)		
Allotment	Species	Estimated Number [a]	Habitat Area [b]	Periods-of-Use [c]	Population Trend [d]	Existing Conflicts [e]
Nyala	Mule Deer	40-50	DW-16	11/1-3/31 (5mo)	Up	Limited winter forage available
			DW-6	11/1-3/31 (5mo)		
	Antelope	20-30	AY-4	1/1-12/31 (12mo)	Static	Limited forb supply and water availability
	Bighorn Sheep	20-30	BH-2	1/1-12/31 (12mo)	Static to Down	Livestock competition poor forage supply
Ralston	Mule Deer	40-50	DW-3	11/1-3/31 (5mo)	Up	Limited winter forage available
			DW-8	11/1-3/31 (5mo)		
	Antelope	50-60	AY-1	1/1-12/31 (12mo)	Static	Limited forb supply and water availability
Reveille	Mule Deer	480-490	DW-9	11/1-3/31 (5mo)	Static to Up	Poor composition on winter and summer ranges
			DW-1	11/1-3/31 (5mo)		High competition with livestock and horses
			DW-6	11/1-3/31 (5mo)		
			DKW-9	11/1-3/31 (5mo)		
			DW-16	11/1-3/31 (5mo)		
			DW-2	11/1-3/31 (5mo)		
			DS-1	4/1-10/31 (7mo)		
			DKS-5	4/1-10/31 (7mo)		
	Antelope	130-140	AY-6	1/1-12/31 (12mo)	Static to Down	High competition for forbs with horses and livestock
			AY-4	1/1-12/31 (12mo)		
				1/1-12/31 (12mo)		

TABLE 2-9 (Continued)
EXISTING STATUS OF BIG GAME

Allotment	Species	Estimated Number a/	Habitat Area b/	Periods-of-Use c/	Population Trend d/	Existing Conflicts e/
San Antone	Mule Deer	380-390	DW-5	11/1-3/31 (5mo)	Up	Limited forage availability
			DW-8	11/1-3/31 (5mo)		
			DW-3	11/1-3/31 (5mo)		
			DW-3 DS-2	1/1-12/31 (12mo)		
Sand Springs	Mule Deer	120-130	DW-12	11/1-3/31 (5mo)	Up	Limited summer and winter range forage
			DW-16	11/1-3/31 (5mo)		
			DW-14	11/1-3/31 (5mo)		
			DS-8	4/1-10/31 (7mo)		
	Antelope	10-20	AY-4	1/1-12/31 (12mo)	Static	Limited forage and water
Smoky	Mule Deer	860-870	DW-6	11/1-4/31 (6mo)	Up to Static	Poor browse production
	Antelope	0-10	AY-1	1/1-12/31 (12mo)	Static	Limited forb supply
Stone Cabin	Mule Deer	780-790	DW-9	11/1-3/31 (5mo)	Up	High competition with horses on summer range livestock and poor winter browse availability
			DKS-5	11/1-3/31 (5mo)		
			DW-8	11/1-3/31 (5mo)		
			DW-1	11/1-3/31 (5mo)		
			DS-1	4/1-10/31 (7mo)		
			DW-11	11/1-3/31 (5mo)		
			DS-7	4/1-10/31 (7mo)		
	Antelope	150-160	AY-2	1/1-12/31 (12mo)	Static to Down	Competition with horses and livestock for forbs and poor forage composition
			AY-5	1/1-12/31 (12mo)		
Wagon Johnnie	Mule Deer	830-840	DW-9	11/1-3/31 (5mo)	Up	Limited winter and summer range forage availability
			DW-11	11/1-3/31 (5mo)		
			DS-7	4/1-10/31 (7mo)		
	Antelope	110-120	AY-3	1/1-12/31 (12mo)		Limited forage, no conflicts
	Elk	100-110	EW-1	2/15-4/15 (2mo)	0	
Willow Creek	Mule Deer	50-60	DW-9	11/1-3/31 (5mo)	Up	Poor forage composition
	Antelope	0-10	AY-2	1/1-12/31 (12mo)	Static	Limited forb supply

a/ See Appendix A, Section 3 for calculation procedure of estimated number. These numbers are estimates and, in actuality, population may be higher or lower due to annual fluctuations. These numbers will be used for analysis purposes only.

b/ Habitat area locations are shown on Big Game Use Areas Map. DW = deer winter, DKW = deer key winter, DS = deer summer, DKS = deer key summer; BH = bighorn; AY = antelope yearlong; EW = elk winter.

c/ Periods-of-use were provided by NDW.

d/ Population trends were taken from G. Tsukamoto, editor, Big Game Investigation Report, 1979.

e/ Conflicts are identified as they pertain to habitat conditions. Data was obtained from NDW publication 1979, personal communications NDW personnel, BLM big game studies 1979, and professional observation.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Wildlife files. Compiled 1979.

MULE DEER

Since the late 1960s, central Nevada deer herds have been slowly increasing. Current populations are approximately 8,000 in the resource area. During the last three years record high fawn production and good survival, coupled with a sound harvest management program which has been sensitive to the reproductive capabilities of the individual herds, has sustained a high buck ratio (Tsukamoto 1979).

Recent surveys by NDW seem to indicate a relatively low percentage of winter fawn loss and recruitment to the adult segment should be adequate to allow for continued expansion. Vegetation trends and precipitation patterns will, however, dictate both short- and long-term deer population trends (Tsukamoto 1979).

As Table 2-9 reveals, deer population trends are generally up. Habitat conditions are generally static or declining throughout the resource area. Reproduction of browse is low on most winter ranges in the resource area. This is a result of "pinyon-juniper encroachment" and grazing of livestock during the winter months on these browse producing areas.

Summer ranges are in fair rather than good condition due to lack of important forb and grass species. Competition by deer, livestock, and horses for forbs and grasses during early summer prevents marked habitat improvement.

A key deer winter range (DKW-13) located near Morey Bench was identified as a result of concentrated use and seasonal dependence by mule deer on a relatively small area. Morey Bench has historically been a significant winter deer use area and encompasses approximately 17,000 acres. The area of heaviest use encompasses a big sagebrush, desert bitterbrush, and Anderson peachbrush plant community. In studies done on the Morey Bench habitat it was determined that this community was in poor condition in 1972 (Tueller and Monroe 1975). It did appear, however, that the plant community was on a slight upward trend in 1972 due to an increase of forage diversity and bitterbrush sprouting.

The habitat on Morey Bench has improved since this time and browse reproduction has increased. This is largely the result of a fence which has excluded livestock grazing since 1970. Pinyon-juniper now appears to be moving down onto the Bench and threatening long-term browse reproduction (USDI, BLM, Tonopah Habitat Investigations, 1976).

The NDW has identified the top of the Kawich Mountains (DKS-5) as key deer summer range. Located above 7,500 feet at the southern end of the Kawich, the key use areas here are mountain mahogany, serviceberry, and bitterbrush in association with water sources, meadows, and riparian habitat.

Competition from livestock and increasing numbers of wild horses, particularly on summer range, has decreased summer range quality due to overutilization of important forbs and grasses. As horse numbers have increased, it has become evident that bitterbrush is an important forage for horses as well as deer and livestock during the winter. The horses also appear to use the grasses and forbs as soon as "green-up" begins in the spring. Grasses constitute an important part of the mule deer diet for a short period in the spring and late fall, particularly if winter forage is scarce (Smith 1976).

ANTELOPE

Antelope occur in small bands and utilize habitat within the resource area (Big Game Use Areas Map). Known use areas include the pinyon-juniper foothills during summer months, with use shifting to valley bottoms in winter months. Additional migration probably occurs, but the extent is unknown. Use patterns for much of the area are related to water availability, which is limited in quantity and distribution. Populations are currently about 560-570 animals resource area wide.

Although no formal range studies have been conducted, it is felt the habitat used by antelope is in poor to fair condition (Tsukamoto 1979). The area lacks sufficient forbs, grasses, meadow, and water distribution for reasonable antelope populations. This situation is aggravated in areas where wild horse concentrations are excessive and livestock use is heavy, resulting in overlapping use of the already limited supply of forage and water. No defined "kidding grounds" or other critical use areas have been identified within the resource area.

BIGHORN SHEEP

The only current population of bighorn sheep in the resource area is located on the north end of the Grant Range (Big Game Use Areas Map). The majority of use from this herd of 100 occurs on the Humboldt National Forest.

This population utilizes adjacent public lands during winter and early spring. Within this range, most observations have been made on the west side of the range between Irwin and Little Meadow Canyons. A small area of public lands and adjoining national forest lands near Troy Canyon has been tentatively identified as a bighorn "lambing area." The area between Irwin Canyon and Box Spring is

thought to receive only incidental bighorn sheep use. Generally, the bighorn sheep winter along elevations just below or in the pinyon-juniper belt. Summer habitat consists primarily of higher elevations where escape cover, forage, and water exist. Bighorn sheep use areas on public lands represent less than quality habitat because of general scarcity of forbs and a reduction of available forage through pinyon-juniper and sagebrush encroachment into grassland and meadow sites.

The winter area (Big Game Use Areas Map) on public lands is particularly critical because heavy mountain snows tend to concentrate these central Nevada bighorn sheep populations onto smaller areas during winter months, increasing the chance for competition with livestock.

Since bighorn sheep prefer grasses over browse, they are more subject to diet similarities with livestock resulting in increased competition when forage is in short supply (McQuivey 1978).

ELK

Fifty Rocky Mountain elk were introduced to the Monitor Range (managed by the Toiyabe National Forest Service) in January of 1979. It is not yet known exactly where they will establish themselves; however, the NDW predicts they will stay almost entirely on FS lands except during the winter. It is currently predicted that after the population establishes itself, approximately 100 head of elk could winter on BLM-administered lands in Little Fish Lake Valley.

UPLAND GAME

SAGE GROUSE

Sage grouse occupy much of the sagebrush habitat within the resource area. The often widely scattered flocks are found primarily along water courses, wet meadows, and in areas of dense sagebrush stands. There is a growing awareness of the importance of mountain meadows to sage grouse. The NDW has long noted the heavy use of meadows in late summer and fall, and Christensen (1967, p. 2) focused attention to them with the following statement: "The upland meadow is an oasis surrounded by a sea of sagebrush and serves as high priority habitat."

There are known strutting grounds and brooding areas on public lands within the area (See Upland Game Map). Three crested wheatgrass seedings have been established in important sage grouse use areas. Their effect on sage grouse has not been determined, however, active strutting grounds are present within these seedings.

WATERFOWL

Railroad Valley Wildlife Management Area, managed jointly by NDW and BLM, provides the only significant waterfowl production in the resource area. These lands have been withdrawn from livestock grazing in order to manage the area primarily for wildlife, especially for the production of waterfowl.

OTHER ANIMALS

In arid climates, key habitat areas such as meadows, water sources, and riparian areas fulfill significant needs for many wildlife species as well as for livestock and wild horses. These biotic communities have an importance to wildlife greatly disproportionate to their limited acreage (Brown et al. 1977). Grazing impacts, however, can be detrimental to wildlife, fisheries, and water quality through soil compaction and sedimentation, loss of bank stability, and loss of riparian vegetation including shrub species (Waldrip and Malespin 1979).

AQUATIC HABITAT

The aquatic habitat within the resource area is restricted, thus limiting the diversity and abundance of fish.

The distribution of native fishes in the area has been studied by Hubbs and Miller (1974). They reported three fishes native to the area: the Railroad Valley Springfish, the speckled Dace, and the Tui Chub. All others have been introduced.

Approximately 20 miles of perennial streams are considered to have suitable habitat for fish within the resource area. All streams, except Six-Mile Creek, begin on FS lands and flow onto BLM-administered public lands for a short distance before either sinking into alluvial fans or being diverted for irrigation on private property.

Six-Mile Creek, near Morey Peak, contains nearly one-third of the suitable habitat for trout within the resource area.

The quantity and quality of the aquatic habitat created by lakes, ponds, and reservoirs within the resource area fluctuate considerably with precipita-

tion patterns. During periods of drought the habitat shrinks and the quality declines. During periods of plentiful rainfall the habitat expands and quality improves.

Table 2-10 summarizes stream habitat conditions on public lands. Barker, Jefferson, and Moores Creeks, all of which drain into Smoky Valley, are in good or excellent condition. This is due primarily to overgrowth of water birch inhibiting livestock access and providing watershed protection (USDI, BLM, Tonopah Stream Surveys, 1976-1978).

Pine Creek, Barley Creek, Corcoran Creek, and Mosquito Creek, all of which drain into Monitor Valley, are in either fair or poor condition. There is little protection from livestock grazing and unstable watershed conditions are preventing stream habitat from improving (USDI, BLM, Tonopah Stream Surveys, 1976-1978).

In Little Fish Lake Valley, Danville Creek is in excellent condition and Clear Creek is in poor condition. The recently implemented Allotment Management Plan (AMP) for this area required the pasture which includes Danville Creek to be rested to protect newly established seedings. Clear Creek, located in another pasture, was not rested and reflects the impacts of livestock grazing on riparian areas. These conditions will change as the AMP cycles the grazing on the pastures.

Six-Mile Creek, in the Hot Creek Range, is in fair condition with a downward trend because livestock grazing and unstable watershed conditions have decreased the riparian vegetation and bank cover resulting in increased erosion, meadow "head cutting," and siltation of pools (USDI, BLM, Tonopah Stream Surveys, 1976-1978).

Little Fish Lake is the only natural lake in the resource area. Approximately two-thirds of the shoreline is on public land. Tui Chubs are present, however, water quality is below the range for optimum fish habitat.

The Railroad Valley Habitat Management Plan (HMP) allows for management of the aquatic habitat in Railroad Valley. The areas are fenced and livestock use is limited by the objectives of the HMP.

THREATENED OR ENDANGERED SPECIES

There are no known animal species determined threatened or endangered by the Fish and Wildlife Service which inhabit or depend on public land habitat within the Tonopah Resource Area.

WILD HORSES

The Tonopah Resource Area currently provides habitat for approximately 2,268 wild horses (26,814 AUMs) located in 11 distinct use areas (Table 2-11). Use area boundaries and populations are identified by the Bureau of Land Management (BLM) in their "Unit Resource Analysis" (URA) for the Tonopah Resource Area, 1978 update. Within each use area are individual "bands" ranging in size from one to fifteen animals (Green, personal communication, 1976). The average band size is six horses. See Wild Horse Use Areas Map for use areas, current numbers, and migration patterns.

PRODUCTIVITY

While no resource area wide data exist for "recruitment rate" or net increase in the population, available information indicates annual increase in the vicinity of 10 to 15 percent. During 1975-76, about 400 horses were trapped in Stone Cabin Valley and removed for adoption. Data from this removal showed 19 colts per 100 adults in 1975 and 32 colts per 100 adults in the spring of 1976. An aerial inventory of the valley in August 1976 indicated the number of colts per 100 adults had dropped to 18 (USDI, BLM, Battle Mountain District Wild Horse Inventory files, 1976). For purposes of analysis an annual net increase of 12.5 percent was used (see Appendix C, Methodology for Computing Increase).

In the Stone Cabin herd use area, foaling starts about the first of April and is almost complete by the first of June. Thus, most breeding takes place between the middle of February and the first of May (Green, personal communication, 1976). This information is important for determining periods when the BLM is limited from gathering excess wild horses and is discussed under Basic Assumptions at the beginning of Chapter 3.

HOME RANGE

Individual wild horse bands in all use areas appear to establish "home ranges" by season, but little information on home ranges exists in most of the Tonopah Resource Area. Green (1976), in his study of the Stone Cabin herd, recorded home ranges for six bands. There was a high degree of overlap between all home ranges recorded. Areas encompassed by recorded home ranges varied from 4.2 to 30.2 square miles (Green, personal

TABLE 2-10
FISH HABITAT CONDITION

Stream	Miles of Stream on: BLM	FS	Private	Fish Species Present a/	Condition Habitat b/	BLM Trend c/
Barker Creek	.5	5.2	.2	BT, RT	Good	Down
Barley Creek	1.0	7.7	.8	BT, RT, BNT	Poor	Static
Clear Creek	1.0	6.0	.1	BT, RT	Poor	Down
Corcoran Creek	1.0	2.6	.7	RT, BNT	Poor	Down
Danville Creek	1.2	5.1	.7	BT, RT	Excellent	Up
Eden Creek	5.0	0	0	None	Fair	Down
Jefferson Creek	1.0	4.0	0	None	Excellent	Static
Moores Creek	.5	8.6	0	BT, RT, BNT, CT	Excellent	Up
Mosquito Creek	1.0	6.5	1.5	BT, RT	Fair	Static
Pine Creek	.5	5.5	2.5	BT, RT, BNT, CT	Fair	Static
Six Mile Creek	7.0	0	.5	BT	Fair	Down
Troy Creek	1.0	4.2	0	BT	Excellent	Up
TOTALS	20.7	55.4	7.0			

a/ Abbreviations used are: BT--Eastern Brook Trout; BNT--Brown Trout; RT--Rainbow Trout; CT--Cutthroat Trout.

b/ Condition Rating System: poor--0-50% optimum habitat
fair--50-60% optimum habitat
good--60-70% optimum habitat
excellent--70+ % optimum habitat
percent optimum habitat is based on pool-riffle ratio, quality of pools, percent desirable stream bottom, bank cover quality and bank stability.

c/ Trend is based on change in percent optimum habitat from 1976-1978. See Source.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Stream Survey files, 1976-1978.

TABLE 2-11
CURRENT WILD HORSE NUMBERS AND VEGETATION USE

Allotment	Use Area	Acres Per Allotment	1979 Population Estimate (Actual Numbers)	Vegetation Use (AUMs)	Months of Use on Resource Area a/
Hot Creek	Hot Creek	124,426	63	756	12
Hunts Canyon	Saulsbury	24,126	32	192	6
Monitor	Hunts Canyon	5,219	6 b/	12	2
Morey	Park Mountain & Upper Hot Creek	106,867	71 c/	852	12
Nyala	South Pancake	53,532	43	516	12
Ralston	Saulsbury	64,008	22	132	6
Reveille	Reveille	544,905	975	11,700	12
Sand Springs	Sand Springs & Upper Hot Creek	205,398	74	888	12
Stone Cabin	Stone Cabin N & S	400,716	910	10,920	12
Wagon Johnnie	Little Fish Lake	110,567	66	792	12
Willow Creek	North Willow Creek	12,691	6	54	9
TOTALS		1,652,455	2,268	26,814	

a/ Because of the natural migration patterns of some of the wild horses between the National Forest and public lands, wild horse use on the resource area may be for only a few months each year.

b/ Forest Service estimate, 1979.

c/ Estimated from Wild Horse Inventory, 1976.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Wild Horse Inventory files, 1976 and 1978.

communication, 1976). The Stone Cabin herd is the only one for which home ranges have been plotted.

COMPETITION AND CONFLICTS WITH OTHER USES

The uses of public lands in the Tonopah Resource Area which significantly conflict with wild horses are the habitat and grazing of cattle, deer, antelope, and other wildlife (Chapter 3, Wildlife). There is a high degree of similarity, especially during some seasons, among wild horse, cattle, and deer diets (USDI, BLM, Ely District, Fecal Analysis, 1975-1976). Nevada Department of Wildlife (Christensen, personal communication, 1978) has documented severe competition among wild horses, cattle, and deer in the Kawich deer summer range. The cumulative demand for forage (1979) in wild horse use areas significantly exceeds estimated annual forage production (Table 1-6).

VISUAL RESOURCES

The Tonopah Resource Area contains a variety of scenic qualities which have been classified into Visual Resource Management Classes following BLM Manual 8400. See Appendix J for a discussion on management classes and their development. The resource area contains examples of all four Resource Management Classes.

A limited amount of acreage is rated in the management Class I because this designation is reserved for areas of national significance. Lunar Crater, in the Crater Black Rock allotment; the Tybo Charcoal Kilns, in the Hot Creek allotment; Berlin, in the Ione allotment; and the James Wild Horse Trap in the Wagon Johnnie allotment are the only areas with Class I designations.

All the allotments have some acreage in Class II except Willow Creek. This designation identifies better than average scenic qualities with highly visible areas. Most of the areas bordering the national forests, the mountainous areas in the Kawich Range, Reveille Range, Grant Range, Pancake Range, parts of the Hot Creek Range, and the northern part of Railroad Valley are designated Class II.

Visual Class designations of III and IV denote varying degrees of generally average scenery or areas that are seldom seen and hence not subject to significant impacts from visual changes. Seedings are an exception in that they usually create a visual contrast greater than the acceptable level for a Class III area (Table J-1 in Appendix J lists the average impacts of range improvements). Table J-2 in Appendix J gives the number of acres in each visual resource management class by allotment. The Visual Resource Map illustrates the distribution by class.

CULTURAL RESOURCES

Cultural resources in the Tonopah Resource Area consist of a variety of prehistoric workshop, habitation, and other "sites;" historic "Shoshone" sites; and historic ranches, homesteads, mines, mining camps, and related objects and structures. The inventory status for "cultural resources" in the Tonopah Resource Area is poor. Only 0.26 percent (9,516 acres) of the acreage has been looked at "intensively" and only 0.67 percent (24,411 acres) "extensively." Also, there is no completed "Class I"–i.e., literature and archive search–for the area although the locations of all or most of the recorded sites are known. The best data comes from a "Class II"–sampling inventory–study conducted in 1976 by the Battle Mountain District Office which sampled 100 percent of the known springs on public land (McGonagle and Waski 1978). Because this was a non-random, biased sample, the data has limited use for predicting the occurrence of cultural resources and for making generalized statements about the types of impacts to which the various kinds of sites may be subjected.

Currently, there are 530 known cultural resources sites for the area; these are catagorized by the following types for management purposes: open aboriginal (prehistoric occupation or workshop sites), "rock shelters" (prehistoric aboriginal), "isolated finds" (single prehistoric or historic "artifact"), historic (Euro-American), historic aboriginal (Shoshone), rock art, and "National Register of Historic Places" sites. Some resources fit into two or more of these categories. Table 2-12 summarizes the number of sites in each of these categories.

The total number of sites in the Tonopah Resource Area can be predicted statistically. Of the 530 known sites, 429 were recorded during intensive surveys which covered .26 percent of the resource area. Therefore, a 100 percent intensive survey should yield approximately 165,000 sites (429 divided by .0026). Broken down by site category, statistical predictions can be made, based again only on sites recorded during intensive surveys; see Table 2-13.

TABLE 2-12
CULTURAL RESOURCES SITES

Management Type	Number of Sites a/
Open Aboriginal	337
Rock Shelters	17
Isolated finds	107
Historic	82
Historic Aboriginal	5
Rock art	7
National Register	2
TOTAL	557

a/ Several cultural resources sites conform and were catagorized in more than one management type.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. Cultural Resources files. Compiled 1979.

TABLE 2-13
ESTIMATED CULTURAL RESOURCES SITES

Management Type	Calculations	Estimated Sites a/
Open Aboriginal	305/.0026	117,308
Rock Shelters	5/.0026	1,923
Isolated Finds	106/.0026	40,769
Historic	24/.0026	9,231
Historic Aboriginal	5/.0026	1,923
Rock Art b/		

a/ Several of the cultural resources sites fit into and were recorded in more than one management type.

b/ None of the rock art sites were recorded during intensive surveys.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. Cultural Resources files. Compiled 1979.

RECREATION RESOURCES

The Recreation Resources in the Tonopah Resource Area were identified and evaluated using the Recreation Information System (RIS) in BLM Manual 6111. Activities such as fishing, various types of hunting, winter sports, vegetation and mineral collecting, and sightseeing are evaluated based on criteria set up to rate the quality of the various opportunities.

Although some areas are highly rated for various recreation opportunities, use in the resource area is extremely light and dispersed, with the exception of hunting. Actions which significantly affect the population of game species could also be expected to affect hunting opportunities. Visitor use is not compiled by the BLM. Data collected by Nevada Department of Wildlife is grouped without distinction between Forest Service (FS) and BLM-administered public lands so that use figures for allotments cannot be reasonably projected from it. Overall, 5,400 hunter days use is estimated to occur annually on the combined BLM and FS lands.

LIVESTOCK GRAZING

There are 26 livestock permittees licensed to graze cattle on 20 allotments within the Tonopah Resource Area. Livestock have harvested an average of 118,941 AUMs of forage annually over the past five years (Table 1-1). Of the 26 permittees, 13 cattle ranchers are based in or are directly adjacent to the resource area. Of the 13 ranchers outside the resource area, eight are authorized to run sheep and the remaining five are authorized to run cattle.

Cattle operations in the resource area are fairly evenly split between cow-calf and cow-calf-"yearling" operations. Most cattle operations are characterized by extensive unfenced areas with heavy dependence on public lands (Table 2-14). As shown in Table 2-14, several permittees have little dependence on the Tonopah Resource Area. Nevertheless, these permittees are greatly dependent upon other public lands such as adjacent Forest Service-administered lands and BLM-administered lands in other districts. This heavy dependence on public lands can be attributed to the small amount of private land owned by livestock operators which is less than one percent of the resource area (Table 1-1). What little private land is available to operators is used for native hay or alfalfa hay production which is either sold or used as a feeding supplement during the winter. Allotments vary in size from 6,000 to 650,000 acres (Table 1-1) and herd sizes from 40 to 5,600 head (Table 2-14).

The huge expanses of land and the availability of yearlong grazing have allowed some ranchers in the area to operate a low cost-labor style of ranching described by many ranchers in the area as a wild-cow operation. In general, wild-cow operations are characterized by large unfenced grazing areas where the cattle must fend for themselves for much of the year. With little intensive management such as this, grazing distribution becomes a problem. This results in almost 100 percent utilization of forage plants close to water and little use on areas away from water.

Livestock movements generally correspond to the changing of the seasons and the weather. In the spring and early summer, cattle in most allotments are moved to summer ranges. They are moved down in the fall when cold weather and snow force them off the summer range. Operators adjacent to national forest lands have summer grazing permits on the national forest; those who do not, either utilize higher elevations and/or adjacent mountain ranges on the same allotment or move to a summer BLM allotment.

Although three of the larger operations have a six month breeding period, most run bulls and cows together yearlong with no set breeding period. Such management results in calving and weaning throughout the year; most operators gather and market calves, yearlings, and culls once a year, usually in the fall. Some operators also gather and market yearlings in the spring. Calves average 350-400 pounds at market time while yearlings average 550-650 pounds. Cattle operations average between 70-73 percent "calf crop" per year after losing about 4-5 percent as death losses. About 17-20 percent of the annual calf crop are usually retained as replacement heifers (Table 2-18). Most operators run mixed breeds of cattle and are most interested in breeding in traits of aggressiveness and browsing ability so that the cattle can do well on a predominately shrub range.

Little information on the sheep operations is available because none of the operators are based within the resource area. Four of the eight sheep operators have taken nonuse for at least the past five years (Table 2-14). Ione and Sand Springs are the only allotments licensed for sheep grazing; both also support cattle at other times of the year. Six of the eight sheep operators have grazing privileges in Sand Springs while the remaining two have grazing privileges in Ione (Table 2-14). All of the licensed sheep operations utilize these areas as winter range as part of yearlong trailing operations based outside the resource area. Most use their grazing

TABLE 2-14
PRESENT LIVESTOCK GRAZING SITUATION

Allotments	Permittee	Approximate Number and Kind of Livestock a/	Periods-of-Use 1978-79	Use areas other than Tonopah Resource Area b/	Dependency of Operators on the Tonopah Resource Area c/	1978-79 Licensed Use (AUMs)	Last Five Year Average Use (AUMs)	1978 Authorized Livestock Demand (AUMs)	Grazing Preference (AUMs)
Blue Eagle	F	68 Cattle	3-1 to 2-28	PV	53%	435	1,287	2,024	2,239
Butterfield	I	250 Cattle	3-1 to 1-15	PV, FS	50%	1,500	1,464	4,779	5,249
Crater Black Rock	N	5,600 Cattle	12-12 to 4-10	PV	30%	5,725	5,217	5,725	8,433
Currant Ranch	H	394 Cattle	12-1 to 4-30	PV, BLM-EY	2%	105	105	105	125
	D	Cattle	6-1 to 8-31	PV, BLM-EY,		Nonuse	62	177	210
Forest Moon	J d/	590 Cattle	3-1 to 2-1	PV, FS, BLM-EY	1%	81	65	253	300
Francisco	E	125 Cattle	Yearlong	PV, FS	74%	1,114	1,008	1,299	1,299
Hot Creek	N	5,600 Cattle	Yearlong	PV, FS	30%	6,433	4,888	6,447	6,447
	N d/	5,600 Cattle	Yearlong	PV	30%	2,235	2,230	2,403	2,403
Hunts Canyon	P	760 Cattle	10-16 to 6-7	PV, FS	79%	3,642	3,703	3,741	4,836
Ione	G	545 Cattle	4-1 to 5-31	PV	9%	564	680	940	940
	S	Sheep	Nonuse	PV, BLM-SE		Nonuse	24	1,350	1,350
	X	8,501 Sheep	11-11 to 3-20	PV, BLM-SE	11%	2,333	984	2,338	2,338
	R	3,300 Cattle	11-10 to 11-19 6-1 to 6-10	PV, FS, BLM-LV	36%	134	117	300	300
	Q	905 Cattle	11-16 to 4-30	PV, FS	30%	3,300	3,449	5,848	5,848
Monitor	M	2,025 Cattle	6-16 to 11-15	PV, FS, BLM-LV	70%	3,549	3,472	3,862	7,423
	P	760 Cattle	10-11 to 11-10	PV, FS	79%	Nonuse	101	149	297
Morey	N	5,600 Cattle	5-16 to 9-15	PV, FS	30%	2,000	1,698	2,250	2,250
Nyala	O	1,600 Cattle	Yearlong	PV, FS, BLM-LV	86%	16,158	13,741	16,157	22,889
Ralston	M	2,025 Cattle	11-16 to 6-15	PV, FS, BLM-LV	70%	13,516	13,034	14,695	16,617
Reveille	L	1,800 Cattle	Yearlong		84%	25,730	25,797	25,730	25,730
San Antone	R	3,300 Cattle	11-1 to 6-30	PV, FS, BLM-LV	36%	11,657	10,515	13,205	13,205
Sand Springs	N	5,600 Cattle	11-21 to 4-30	PV, FS, BLM-SE, EY	30%	3,892	3,526	3,918	3,918
	T	2,900 Sheep	2-1 to 2-28	PV, FS, EY	4%	288	513	927	927
	V	2,750 Sheep	Nonuse	PV, FS, BLM-EL, EY		Nonuse	Nonuse	928	928
	U	Sheep	Nonuse	PV		Nonuse	Nonuse	788	788
	W d/	Sheep	11-1 to 4-15	PV, BLM-SE		Nonuse	1,296	2,221	2,221
	Y	Sheep	Nonuse	PV, BLM-EY		Nonuse	Nonuse	810	810
	Z	Sheep	Nonuse	PV, BLM-EY		Nonuse	Nonuse	1,189	1,189
Smoky	R	3,300 Cattle	11-20 to 6-30	PV, FS, BLM-LV	36%	2,468	2,980	4,671	4,671
	B	200 Cattle	Yearlong	PV, FS	43%	1,030	1,030	1,030	1,030
	A	40 Cattle	5-15 to 8-14	PV	25%	120	120	120	120
Stone Cabin	K	1,000 Cattle	Yearlong	PV, FS	76%	5,297	7,923	10,173	10,173
	C	178 Cattle	Yearlong	PV	88%	1,887	1,332	1,892	2,312
	P	760 Cattle	Yearlong	PV, FS	79%	3,179	3,138	3,179	3,179
Wagon Johnnie	K	1,000 Cattle	5-16 to 10-14	PV, FS	76%	3,866	3,172	4,359	7,845
Willow Creek	P	760 Cattle	6-11 to 10-10	PV, FS	79%	340	270	338	338
TOTALS						122,578	118,941	150,320	171,177

a/ Herd size by operator was taken from 1978-79 grazing licenses. Herd size may vary from year to year as a result of market and climate conditions. No information was available for herd sizes not shown.

b/ PV--Private land
FS--USDA, Forest Service
BLM-EL--Bureau of Land Management Elko District
BLM-EY--Bureau of Land Management Ely District
BLM-SE--Bureau of Land Management Battle Mountain District, Shoshone-Eureka Resource Area
BLM-LV--Bureau of Land Management Las Vegas District

c/ No information for Operator Dependency was available for allotments not shown.

d/ Leased from owner.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Grazing files and Management Framework Plan, 1979.

privileges on the Tonopah Resource Area only during severe winters when snows are too deep on their normal range.

As determined in the 1959-64 range survey, 83 percent (2,998,059 acres) of the Tonopah Resource Area is currently suitable for grazing by livestock and wild horses. Nine percent (326,238 acres) was determined to be unsuitable for livestock and wild horse grazing because of slope in excess of 50 percent, playa lakes, and physical barriers (e.g., rocks). Another eight percent (292,434 acres) of the resource area was found to be "potentially suitable" but currently unsuitable for livestock and wild horse grazing due to critical erosion conditions or lack of available water. Table 2-15 gives a summary of acreage in each suitability classification. Refer to Appendix A Section 1, Table A-1 for suitability acreage by allotment and the methodology for suitability determination.

An ear tagging program begun in 1977 to improve range supervision has greatly helped to control trespass which had been a significant problem in the past. Even though some problems such as trespass have been brought under control by effective range administration other problems still exist. Significant-greater than 15 percent-overuse is causing destruction of the vegetative resource in seven allotments, and at the same time vegetation is being significantly-less than 15 percent-underused in six allotments (Table 1-1).

WILDERNESS POTENTIAL

A wilderness inventory, in accordance with Sec. 603(a) of the Federal Land Policy and Management Act (FLPMA), is currently being completed on the public lands in the Tonopah Resource Area. Prior to implementation of any actions, the areas will have to be inventoried and impacts on potential wilderness values assessed.

Until Congress acts on an area that has been designated as a Wilderness Study Area, multiple-use activities which existed in the area prior to the passage of FLPMA (October 21, 1976) may continue in the same manner and degree. New or expanded activities will be allowed if these uses meet the guidelines set forth in the wilderness Interim Management Policy (IMP).

Under the guidance of FLPMA, the BLM has developed wilderness review procedures to be used to inventory and select potential wilderness areas. These procedures provide for protection and interim management of areas that may qualify for wilderness until a final determination can be made by Congress.

The BLM role in the wilderness review procedure is to recommend to the Secretary of the Interior, President, and Congress which public lands are suitable or nonsuitable for wilderness preservation. Congress makes the final decision on what areas will be included in the National Wilderness Preservation System.

An intensive wilderness inventory phase conducted during 1979 has tentatively identified 11 areas in the Tonopah Resource Area that may contain potential wilderness characteristics. The public will be given an opportunity to comment before the BLM State Director makes a decision, by September 30, 1980, on which areas will be designated as Wilderness Study Areas. These 11 areas are mainly located in the mountain ranges of the resource area (Wilderness Inventory Categories Map) and contain a total of 497,400 acres, approximately 14 percent of the resource area (Table 2-16). Eleven allotments have one or more proposed wilderness areas located within their boundaries. Livestock grazing occurs in all proposed study areas. They also contain livestock support facilities such as fences, spring developments, wells, tanks, and troughs.

For compliance with wilderness directives, all proposed projects located in areas under wilderness consideration would be reviewed in accordance with the wilderness Interim Management Policy (IMP) and Section 603(a) of FLPMA. This review would be conducted on a project by project basis as part of the required environmental assessment (Standard Operating Procedures, Number 1 of Chapter 1).

SOCIAL AND ECONOMIC VALUES

INTRODUCTION

The social-economic section deals with impacts on the people who live in the area, hunters who use the area, and groups who have special interests in the area. It should be noted that the social and economic components are combined into a single section rather than being presented as two separate sections.

Ranchers will be discussed first followed by a discussion of the community. Information on ranch operation is based on information supplied by ranchers and secondary sources. Relevant method-

TABLE 2-15

GRAZING SUITABILITY SUMMARY a/ (ACRES)

Unsuitable b/	%	Potentially Suitable c/	%	Suitable	%	Total
326,238	9	292,434	8	2,998,061	83	3,616,733

a/ Applies only to livestock and wild horses.

b/ Includes acres which are unsuitable due to slope, waste types, and barren types.

c/ Includes acres which are currently unsuitable due to Soil Surface Factor or lack of water.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area; 1959-64 Tonopah Range Survey, 1979 compilation of the Tonopah Range Survey.

TABLE 2-16

PROPOSED WILDERNESS STUDY AREAS

Study Areas	Acres
Antelope	34,900
Blue Eagle	58,800
Grant Range	7,200
Grants a/	32,000
Kawich	64,400
Morey	20,100
Palisade Mesa	99,600
Park Range a/	8,600
Rawhide Mountain	27,600
South Reveille	106,200
The Wall	38,000
TOTAL	497,400

a/ Proposed study areas that are adjacent to and are included with The Ely Districts Wilderness proposal.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. Wilderness Study files, compiled 1980.

ologies and computations not contained in this section can be found in Appendix K.

RANCHERS

RANCHER BACKGROUND

Twenty-six ranchers have permits to graze in the Tonopah Resource Area. Of these, 18 are licensed to run cattle and eight are licensed to run sheep. For the purpose of this economic analysis, ranches are broken into four categories based on September 1979 data:

a) Small cattle ranch; 40-200 Brood Cows (120 typical).

b) Medium cattle ranch; 250-600 Brood Cows (360 typical).

c) Large cattle ranch; 800-5,000 Brood Cows (2,200 typical).

d) Sheep ranch; 2,000-8,500 Ewes (3,890 typical).

Table 2-17 shows a summary breakdown of the number of operators and number of Animal Unit Months (AUMs) by size and livestock category. The eight large cattle operators control 85 percent of the preference AUMs and license 92 percent of the five year average use AUMs in the resource area.

Eight sheep operators have permits to use forage in the resource area. Only four of these operators have used or leased their preference in the last five years. Only two sheep ranchers used their permits in the 1978-79 license year. All sheep permit holders reside outside the resource area. Numbers of sheep have been declining in the resource area since the 1950s. There is no indication that this trend will be reversed.

In addition to the 26 ranchers operating in the area, there are three individuals who lease their base property and attached preferences. The value of their leases is largely determined by the BLM grazing preferences involved.

Historically, the dominant mode of ranching in the resource area has been the small family owned ranch with attached public land grazing privileges. However, this tradition appears to be giving way to large corporate agribusiness ranches. A study of county tax records reveals that a trend toward ranch consolidation has been underway for several years. Previously independent ranches have become components of the larger ranches existing today (Ganzel 1976); see Appendix K. There seemed to be consensual agreement among the ranchers contacted by the BLM, Nevada State Office Social Scientist during June, July, and August of 1979 that the increase in ranch turnover in the past five to ten years has been due to a combination of factors, such as drought, low beef prices, and increasing government regulation of the industry (Appendix K). This has, according to the ranchers, created a great deal of uncertainty. This uncertainity is blamed for the departure of sons or daughters who had been expected to maintain the family ranching tradition.

Of the 16 ranchers interviewed, five are generationally linked to the Tonopah Resource Area by ancestral ties dating back to the middle or late 1800s; six have area family ties dating back to the early 1900s; two have resided in the area from five to ten years; one has recently moved into the area, and two reside out of state. All of those interviewed indicated that they had been involved with the ranching industry in some capacity all of their adult lives. Nine of these ranchers devote full-time to their ranching responsibilities, while the remaining seven devote varying amounts of the work week to their ranching responsibilities in addition to part-time employment off-ranch, or being actively involved in other activities in which they have an interest.

ECONOMICS

Cattle ranchers in the Tonopah Resource Area are, in general, dependent on BLM grazing privileges to be economically viable. The majority of the cattle operations in the area have a portion of their cattle on BLM or Forest Service-administered land all year long. Those with Forest Service permits generally use Forest Service lands for summer range. BLM-administered public lands provide critical winter grazing for all of the operations which have a large percentage of their AUMs in the area.

Table 2-18 summarizes production parameters and feed sources for typical cattle ranches in each size category. All ranch sizes are highly dependent on BLM (Tonopah Resource Area and other BLM Districts) as the primary feed source. Small ranches have slightly lower death losses and higher calving rates, presumably because of closer control of the herds.

Budgets, based on 1978 costs, and returns, based on Table 2-18 production parameters and 1978 prices, were developed for each cattle ranch size category in the Tonopah Resource Area. A summarized version appears in Table 2-19. It should be noted that 1978 cattle prices were much higher than prices in previous years and hence, these budgets represent a good year. A typical sheep budget previously developed by the Economics, Statistics, and Cooperatives Service

TABLE 2-17
NUMBER OF OPERATORS AND LIVESTOCK AUMS

	Operators		Preference AUMs		Five Year Average Actual Use AUMs		1978-79 Actual Use AUMs	
	#	%	#	%	#	%	#	%
Cattle Operations								
Small (40-200 Brood Cows)	6	23	6,542	4	4,839	4	4,586	4
Medium (250-600 Brood Cows)	4	15	6,077	4	2,315	2	2,264	2
Large (800-5,000 Brood Cows)	8	31	127,150	85	108,971	92	113,478	92
TOTAL CATTLE	18	69	139,769	93	116,125	98	120,328	98
Sheep Operators	8	31	10,551	7	2,816	2	2,621	2
TOTAL	26	100	150,320	100	118,941	100	122,949	100

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. License Records. Compiled 1979.

TABLE 2-18
TYPICAL CATTLE RANCHES BY SIZE CATEGORY

Production Parameters	Small	Medium	Large
# Brood cows	120	360	2,200
# Cows/Bull	20	20	12
% Heifers saved	18%	17%	20%
% Cows and Heifers culled	13%	11%	15%
% Cow and Heifer death loss	3%	6%	5%
Months of calving season	YL a/	YL	6 months-YL
% Calves born alive	77%	75%	75%
% Calf death loss	4%	5%	5%
Market Weights			
Calves			
Steers	400	371	375
Heifers	350	355	365
Yearlings			
Steers	650	650	580
Heifers	550	600	555
Cull Cows	850	900	850
Source of Feed			
BLM b/	58%	66%	48%
Forest Service	11%	22%	10%
Hay	17%	1%	5%
Crop Residue	2%	4%	15%
Private Pasture	11%	7%	21%

a/ Yearlong

b/ All BLM grazing including resource areas outside Tonopah.

Source: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service in cooperation with Tonopah Producers Panel, Nevada Cattlemen's Association Western Livestock Producer Budgeting worksheets, Cattle Enterprises in Tonopah, Nevada. 1979.

TABLE 2-19
SUMMARY OF BUDGET INFORMATION a/

	Cattle Operations		
	Small	Medium	Large
Receipts	28,874	69,479	436,122
Total Cash Costs	9,250	35,272	138,831
Returns Above Cash Costs	17,624	34,207	297,291
Operator and Family Labor (at $3.70/hr.)	7,448	10,000	16,837
Returns Above Cash Costs and Operator and Family Labor	10,176	24,207	280,454
Net Ranch Income b/	6,812	19,369	266,394
Total Current Investment	148,883	252,713	3,671,729

a/ Based on 1978 costs and returns.

b/ Includes depreciation, money left to service long-term debts on land and capital returns to risk and management.

Source: Gee, Kerry. U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service. Agricultural Economist. Result of linear programming analysis. December 1979-January 1980.

(ESCS) for the Great Basin was chosen for the economic analysis. The complete budgets and a description of the methodology appear in Appendix K.

All size categories had positive net ranch income in 1978. Net ranch income is the amount available to pay off long-term debts on land and capital as well as pay a return on management. Although returns were positive, returns to ranching were much lower than alternative forms of investment. Based on average inventories, returns were five percent, eight percent, and seven percent for small, medium, and large ranches, respectively.

RANCHER PERCEPTIONS

All of the ranchers contacted felt that their many years of experience in the practical application of range management practices in an essentially desert operation make them qualified experts in this specialized type of ranching–expertise which they perceive to be lacking in BLM employees who are charged with the responsibility for administering these lands. This tends to create a credibility gap between BLM employees and members of the ranching community.

The majority of the ranchers interviewed (75 percent) stated that if the state controlled the approximately 49 million acres of BLM-administered lands within Nevada, the State government would be far more responsive to their ranching needs than is BLM. State control of these lands would also, in their viewpoint, eliminate the Federal public lands multiple-use mandate–a mandate that many members of the ranching community feel endangers, in some respects, their continued access to BLM-administered public lands. The majority of those interviewed (75 percent) stated that they actively support the Sagebrush Rebellion–an act passed by the Nevada Legislature in 1979 (AB 413) which states, in part "...subject to existing rights, all public lands in Nevada and all minerals not previously appropriated are the property of the State of Nevada and subject to its jurisdiction and control." This legislative seizure of approximately 49 million acres of BLM-administered public lands within the state is, in the words of one rancher, "the first step toward getting the cattle industry back on its feet in Nevada after years of harrassment and mis-management by the Federal government."

Many of the ranchers (60 percent) expressed some sympathy for the dilemma the Bureau of Land Management finds itself in when trying to resolve conflicting, multiple-use demands. Nonetheless, "they do not feel capable of sharing a portion of these lands which provides them with a precarious living" (Ganzel 1976). Most of the ranchers feel that wild horses and burros should be maintained, but that strict, mandatory herd management controls should be imposed. There also seemed to be consensual agreement against the allocation of vegetation for reasonable numbers of wildlife. Specifically, ranchers interviewed felt that the criteria used in determining reasonable numbers should be justified more realistically.

NYE COUNTY SOCIAL-ECONOMIC CHARACTERISTICS

POPULATION, EMPLOYMENT AND INCOME

The 1979 population of Nye County is 7,994 (ABT Associates Inc. 1979), a growth of 43 percent over the 1970 population of 5,599. The population of 5,599 registered by the 1970 census was predominantly of Caucasian ancestry, with an American Indian minority of four percent and only a few inhabitants of other racial ancestries. Males outnumber females with males comprising 56.4 percent of the total.

Although the 1970 population represents an average density of only 0.3 persons per square mile, it is by no means evenly distributed over the county (ABT Associates Inc. 1979). The unincorporated town of Tonopah with a population of approximately 2,300 is the largest town in the area and is located on the southern border of the region. There are several smaller communities in the interior of the region, e.g., Warm Springs, Ione, Nyala, and the ghost towns of Manhattan and Belmont, all with populations of under 50; and Round Mountain and Smoky Valley with a combined population of approximately 600.

There is no clearly defined regional market center for the area. Limited services exist and major purchases are generally made outside the area. Depending on one's location and the service or goods to be obtained, a resident may travel to Bishop, California; Reno, Ely, Fallon, or Las Vegas, Nevada–all distances in excess of 100 miles from the resource area. Because of the lack of any defined region, this analysis focuses primarily on Nye County.

Tourism is the dominant employment and an important income sector in Nye County. Tonopah's location on a transportation artery between growing urban centers has meant an important service role catering to increasing numbers of pass-through and smaller numbers of visiting tourists. Tourism employment and income statistics are captured in the service and trade sectors. Services accounted for

26 percent of employment and 16 percent of income while trade accounted for nine percent of employment and seven percent of income (Tables 2-20 and 2-21). The citizens of Tonopah would like to see much more tourism, especially tourists who are coming to, rather than passing through, the region. Such tourism would mean hunters, fishermen, rockhounds, off-road vehicle enthusiasts, and others whose interests may conflict with those of local ranchers. Ranching families, however, generally express an openness to these visitors and a willingness to share public lands with them (Ganzel 1976).

Hunting is a component of the tourism income and employment in the county as a result of hunter expenditures. Another measure of hunting, i.e., hunting value, is discussed below. Hunting occurs primarily for mule deer, antelope, doves, sage grouse, and rabbits. Based on an average 1978 expenditure of $18 per day for big game and $7 per day for small game (USDA, Forest Service, 1980), hunting contributed 7.1 full time equivalent jobs and $50,100 income to the county. This represents 0.2 percent of the total county income and employment (Appendix K).

The total value of hunting to those who participate can not be measured by local expenditures alone. Nonlocal expenditures may occur for equipment and supplies and income may be foregone in traveling to the hunting site. In addition, hunters are not charged for hunting on public lands. This may be considered an additional bonus or value over what they would be willing to pay as an entrance fee on private lands. Based on a value estimate of $83 per deer hunter day and $33 per small game hunter day (USDA, Forest Service, 1977; and Appendix K) the value of hunting recreation is $524,100.

Many of the communities in the resource area are historical mining areas that once had many times their current populations. In 1977, mining employment was 586 or 20 percent of total employment. Mining was the largest income sector in 1977, accounting for 32 percent of total income. Mining is currently expanding. Anaconda has a planned molybdenum mine that is projected to employ 400 persons by 1981. High gold and silver prices have spurred additional mining interest in the area. Mining is likely to assume even more importance in the resource area in the future.

Government was the second largest employment and income sector in Nye County in 1977. Most government employees work for state and local government. Average BLM employment was 20 persons (.7 percent of total county employment) in 1977. Federal employment could grow significantly in the future with the development of the MX missile system. The Air Force could employ over 15,000 persons in the resource area by 1985.

Gross cash receipts from marketing agricultural products in Nye County was $4 million in 1977. Livestock sales accounted for $2,317,000 or 58 percent of the total agricultural sales (Bureau of Economic Analysis, Farm Income Reports, 1979). Total net farm income was $778,000 in 1977 for two percent of the total county income. Total employment in agriculture was seven percent of the county employment in 1978. Major growth in the agricultural section is not foreseen.

TAXES AND FISCAL STRUCTURE

The total county tax base has grown from $58.5 to $90.0 million during the fiscal years 1974-75 to 1977-78 period (Table 2-22). Ranching is a small contributor to the county tax base. A comprehensive examination of property tax records for ranches in northern Nye County indicates that investment in such forms of real property as houses, barns, and ranch equipment is small. The dominant components of assessed property are cattle and private lands, even though owned acreage is limited in most cases. Not included in such assessment data are actual investments for developing water supplies on public lands which are integral to existing operations (Ganzel 1976).

In the 1977-1978 fiscal year the total assessed value of agricultural land was $1,312,805, with cultivated land accounting for most of the value. The assessed value of livestock and bees (phrase used by U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service) was $1,356,952. Figuring that roughly one-third of the land value and two-thirds of the livestock is in the resource area, agricultural land and livestock in the area account for $1.3 million of the assessed value. Other rural personal property includes farm equipment and machinery. If one-half of the $.6 million total for this category is from the resource area, the total assessed agricultural value is $1.6 million. This represents two percent of the total $90 million of assessed valuation.

Agriculture's share of the tax base has declined since the 1974-75 fiscal year. Assessed agricultural land and livestock and bees has declined from $4.2 million in 1974-75 to $1.7 million in 1977-78. This has been caused by a decline in agricultural acreage and number of livestock in the county. The 1979 Legislature in SB No. 77 exempts from taxation livestock held for business purposes. This will be implemented over a five year period with no tax on livestock for business purposes by fiscal year 1983-84. If all other categories remain the same,

TABLE 2-20
NYE COUNTY EMPLOYMENT 1972-1977

	1972	1973	1974	1975	1976	1977	1977 as Percent of Total
Agriculture							
Proprietors	114	108	101	101	101	101	4
Wage & Salary	78	69	65	65	77	74	3
Mining	322	369	437	510	503	586	20
Construction	108	148	115	147	120	69	2
Manufacturing	20	19	22	33	33	43	1
Transportation and Public Utilities	108	D	105	84	97	119	4
Wholesale Trade	D	D	D	D	D	D	
Retail Trade	246	239	261	265	294	256	9
Finance, Insurance and Real Estate	D	D	D	99	150	D	
Services a/	1,427	878	826	822	784	735	26
Government							
Federal	276	243	233	210	190	209	7
State and Local	428	435	445	488	506	535	19
TOTAL Employment	3,187	2,738	2,728	2,823	2,871	2,871	100

D--Not shown to avoid disclosure of confidential information, data included in total.

a/ Excludes 2,790 jobs held by Clark County commuters to the Mercury Test Site and includes nonfarm proprietors.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. "Employment by Type and Broad Industrial Sources 1972-1977." Nye County. Computer printout. No date.

TABLE 2-21
NYE COUNTY
PERSONAL INCOME BY MAJOR SOURCE
(Thousands of Dollars)

Total Income	1972	1973	1974	1975	1976	1977	1977 Percent of Total
Farming	743	1,509	353	266	652	716	2
Mining	3,496	4,245	5,532	6,869	7,455	9,826	32
Construction	1,483	1,508	1,692	2,522	2,068	1,230	4
Manufacturing	133	154	187	229	285	423	1
Transportation and Public Utilities	1,364	D	1,626	1,369	1,779	2,262	7
Retail Trade	1,652	1,160	1,908	1,953	2,226	2,149	7
Wholesale Trade	D	D	D	D	D	D	
Finance Insurance and Real Estate	D	D	D	1,138	1,904	D	
Services a/	6,175	4,720	4,590	5,155	5,430	4,908	16
Government, Federal, Civilian	1,895	1,305	1,324	1,494	1,351	1,447	5
Federal, Military	1,020	993	956	874	842	978	3
State and Local	3,051	3,360	3,686	4,373	4,824	5,358	17
TOTAL	21,642	22,375	23,144	26,389	28,988	31,174	100

D--Not shown to avoid disclosure of confidential information, data are included in total.

a/ All of residence adjustment was subtracted from services.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economics Information System. "Personal Income by Major Sources, 1972-1977." Table 5, Nye County. Computer printout. April 1979.

TABLE 2-22
NYE COUNTY
ASSESSED VALUATION

Tax Category	70-71	74-75	75-76	76-77	77-78	Percent Change 74-75 77-78	Percent 1978 of Total
		Fiscal Years					
Agriculture Land							
Cultivated Acreage	797,678	1,021,617	966,520	743,905	699,222		
Wild Hay & Meadow Hay	96,142	126,292	119,003	95,110	86,195		
Pasture	374,137	428,952	417,039	253,464	239,370		
Grazing	669,702	612,669	600,782	307,393	288,018		
SUBTOTAL	1,937,659	2,189,530	2,103,344	1,399,872	1,312,805	-40%	1%
Livestock and Bees	1,209,112	2,055,573	1,835,526	1,583,219	1,356,952	-34%	1%
Rural-Other	847,506	767,248	833,227	617,164	587,919	-23%	1%
Rural Improvements	499,317	567,314	576,920	478,487	505,934	-11%	1%
Special Lands	5,578,521	29,278,905	31,859,105	47,892,282	52,818,412	+80%	55%
Urban Lands	5,074,775	8,213,393	7,400,515	7,493,817	8,297,896	+1%	9%
Mining	3,266,004	5,024,932	6,402,601	7,808,383	12,817,100	+155%	14%
Miscellaneous	10,432,240	13,040,738	14,288,320	15,532,704	17,238,453	+32%	18%
TOTAL Gross	28,845,133	61,137,633	65,299,558	82,805,928	94,935,471	+55%	100%
Exemptions	930,345	2,647,638	2,936,648	3,287,837	4,966,950		
Net Valuation	27,147,788	58,489,995	62,362,910	79,518,091	89,968,521	+54%	

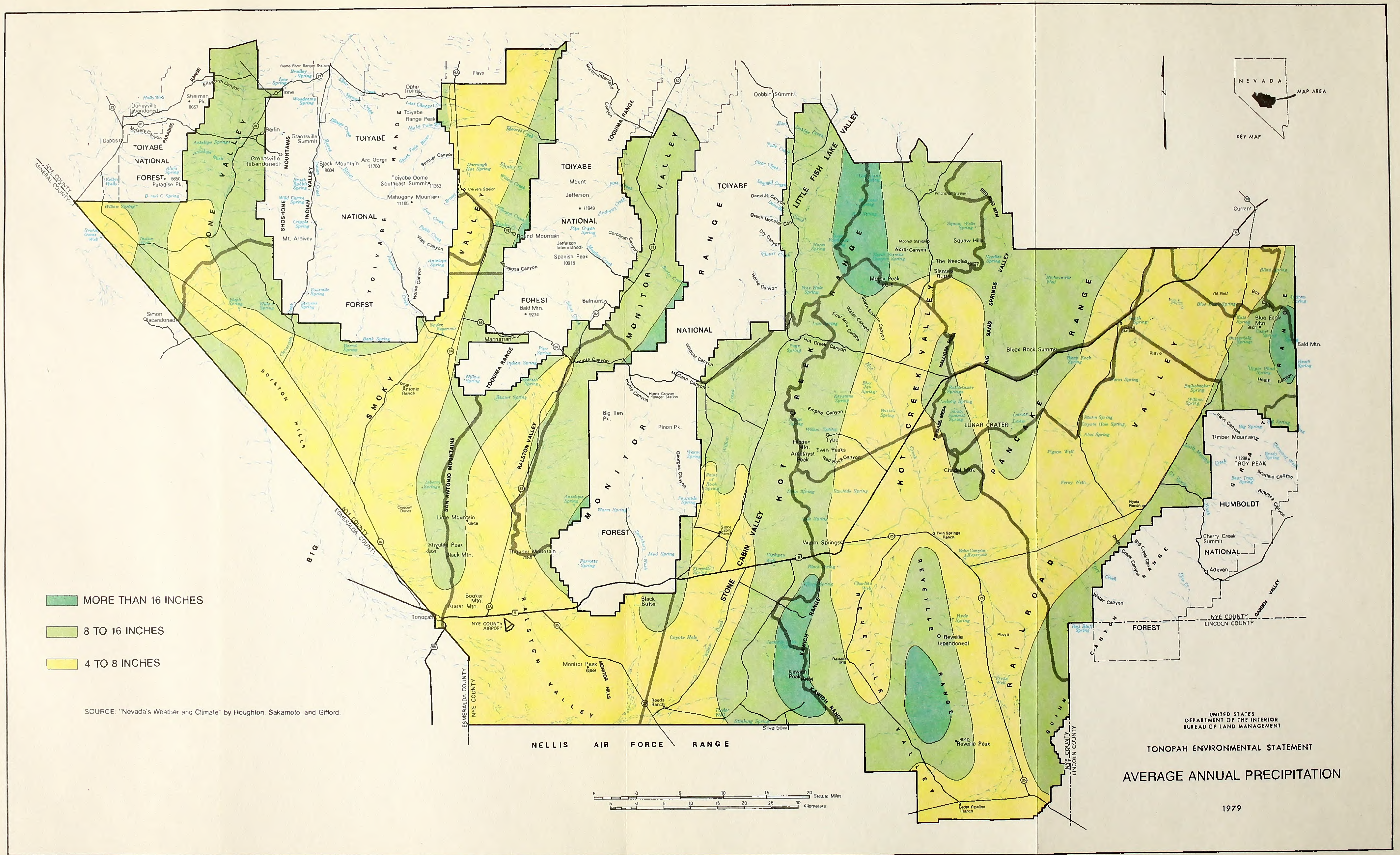
Source: Nevada Department of Taxation Report "Segregation of Tax Rolls" 1970-1978.

this will further reduce ranching's contributions to county taxes to less than one percent of the total.

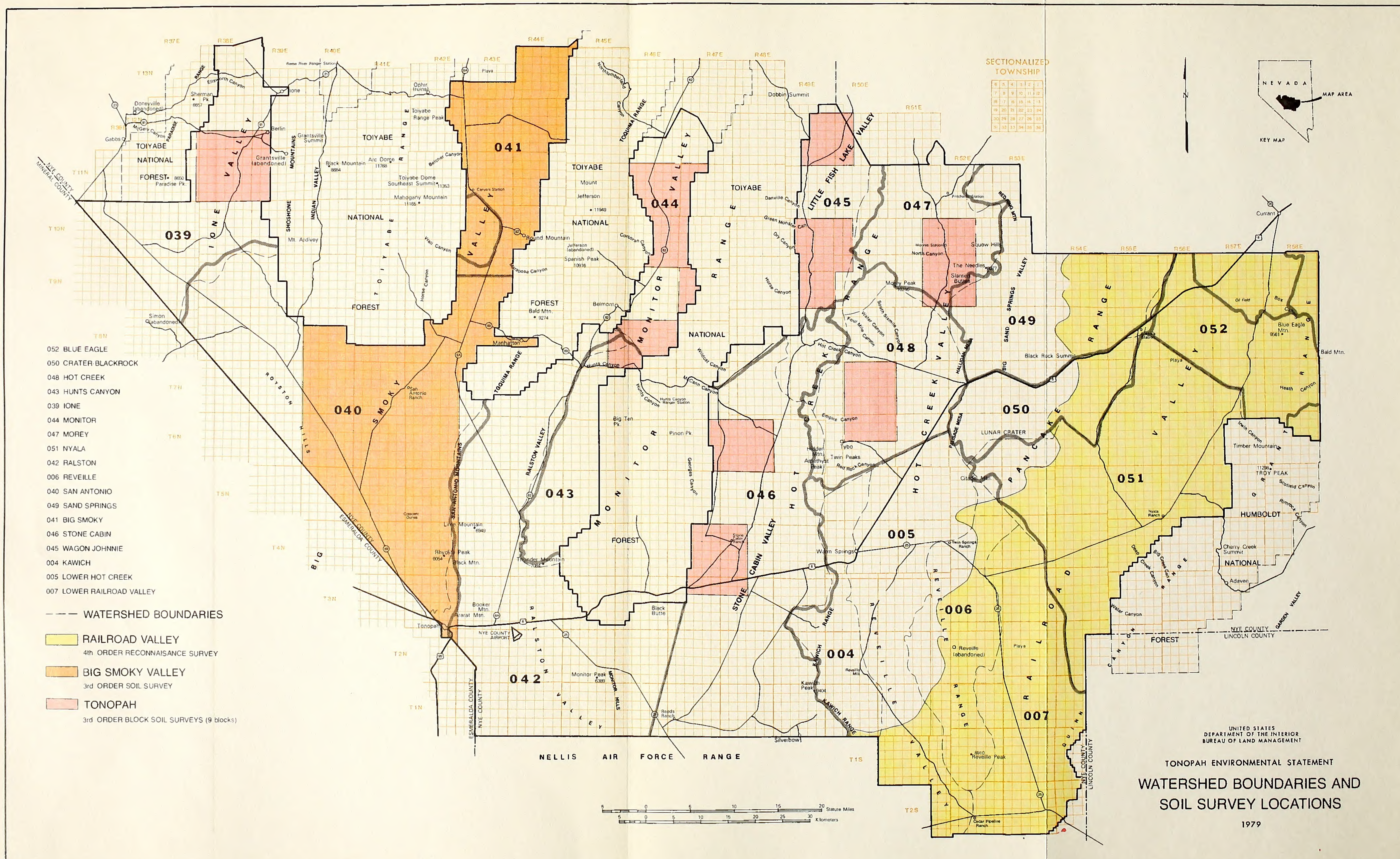
In 1977-78, property was taxed at 3.71 percent of assessed valuation. Property taxes accounted for $3.3 million of the $11 million in revenue required for Nye County. Ranching in the resource area provided $59,200 (0.5 percent) of this total. Other sources of county revenue include federal in-lieu-of tax payments of $282,312, other federal grants, fees, licenses, and State collected taxes (sales taxes, gaming taxes, etc.).

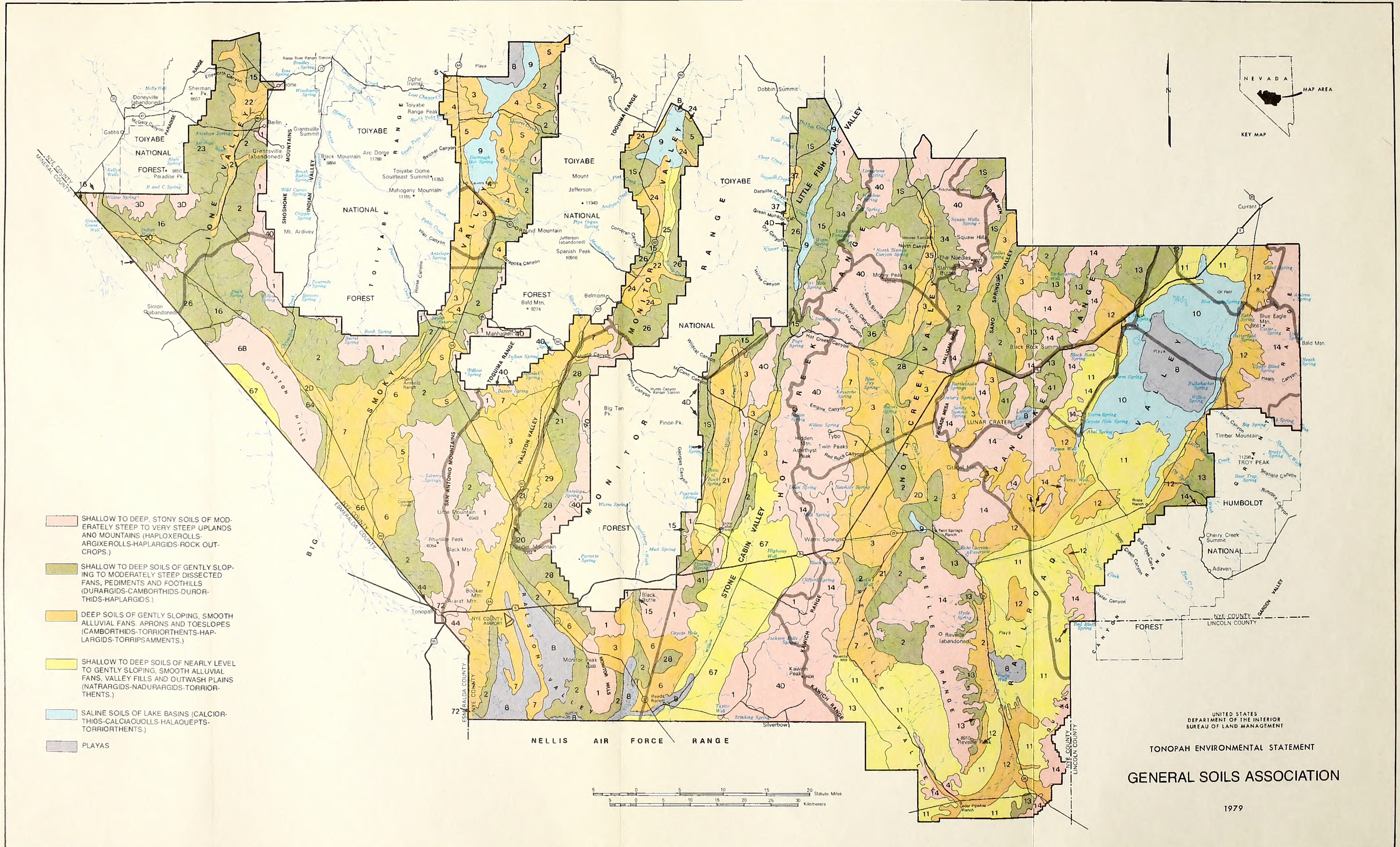
REGIONAL ATTITUDES

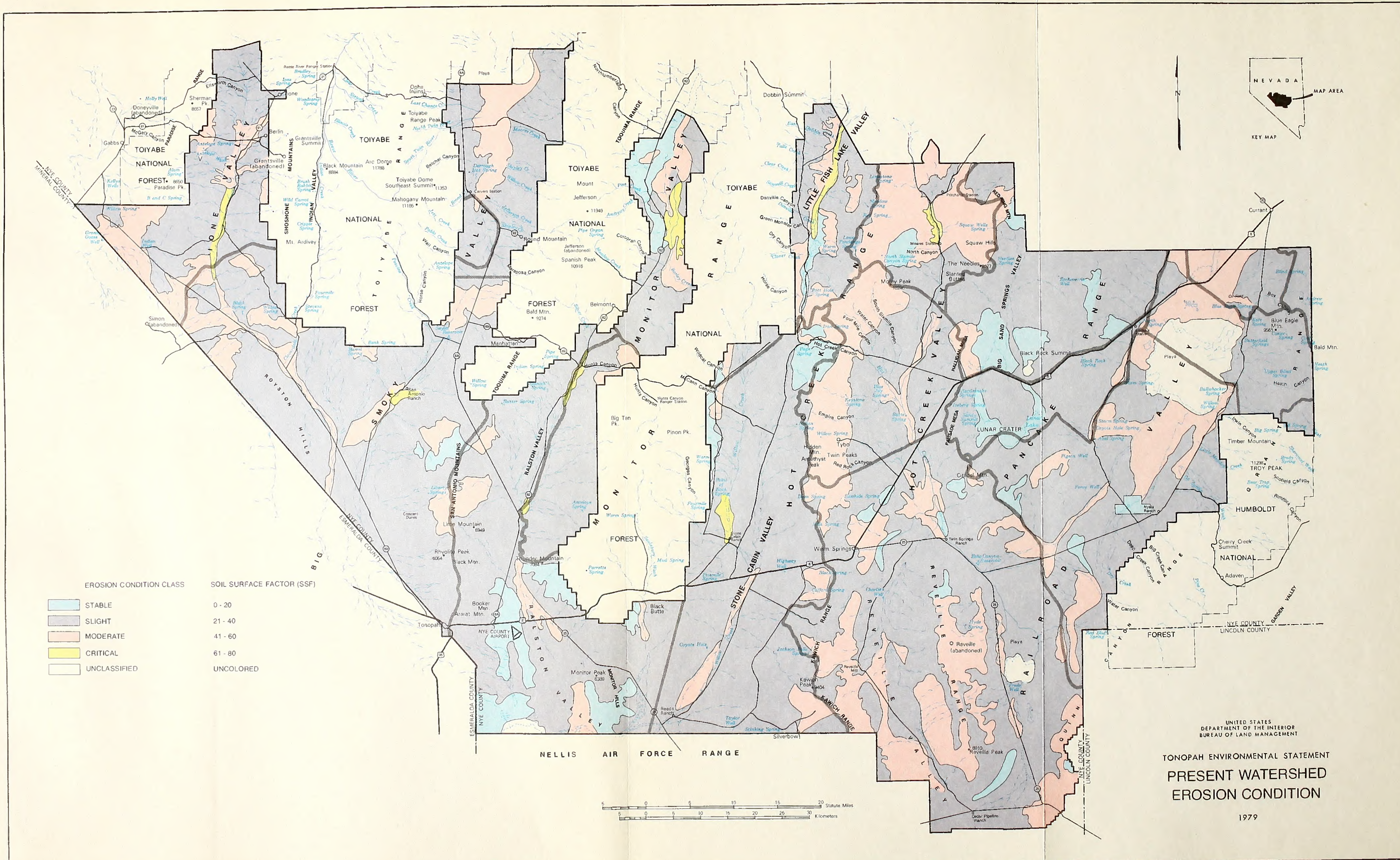
The values and attitudes in the region largely reflect the conservative attitudes and value systems evident throughout rural Nevada. Consequently, change comes at a much slower pace than in other parts of the United States. Area residents "place a high value on attachment to the land and its traditional uses, and they are largely dependent on the land for their livelihood. They take pride in making their living from a land which yields its bounty only to hard work and protracted struggle" (ABT Associates 1979). Many of the regional residents are concerned by the continued Federal ownership and management of regional lands–especially when that ownership and management is perceived by those residents as altering or restricting the traditional use of those lands. This strong feeling for traditional use of the land is reflected in the 1978 Nye County Use Plan which states, among other things, that "current and past use of the land resources should be a guide for the development of future planning elements."

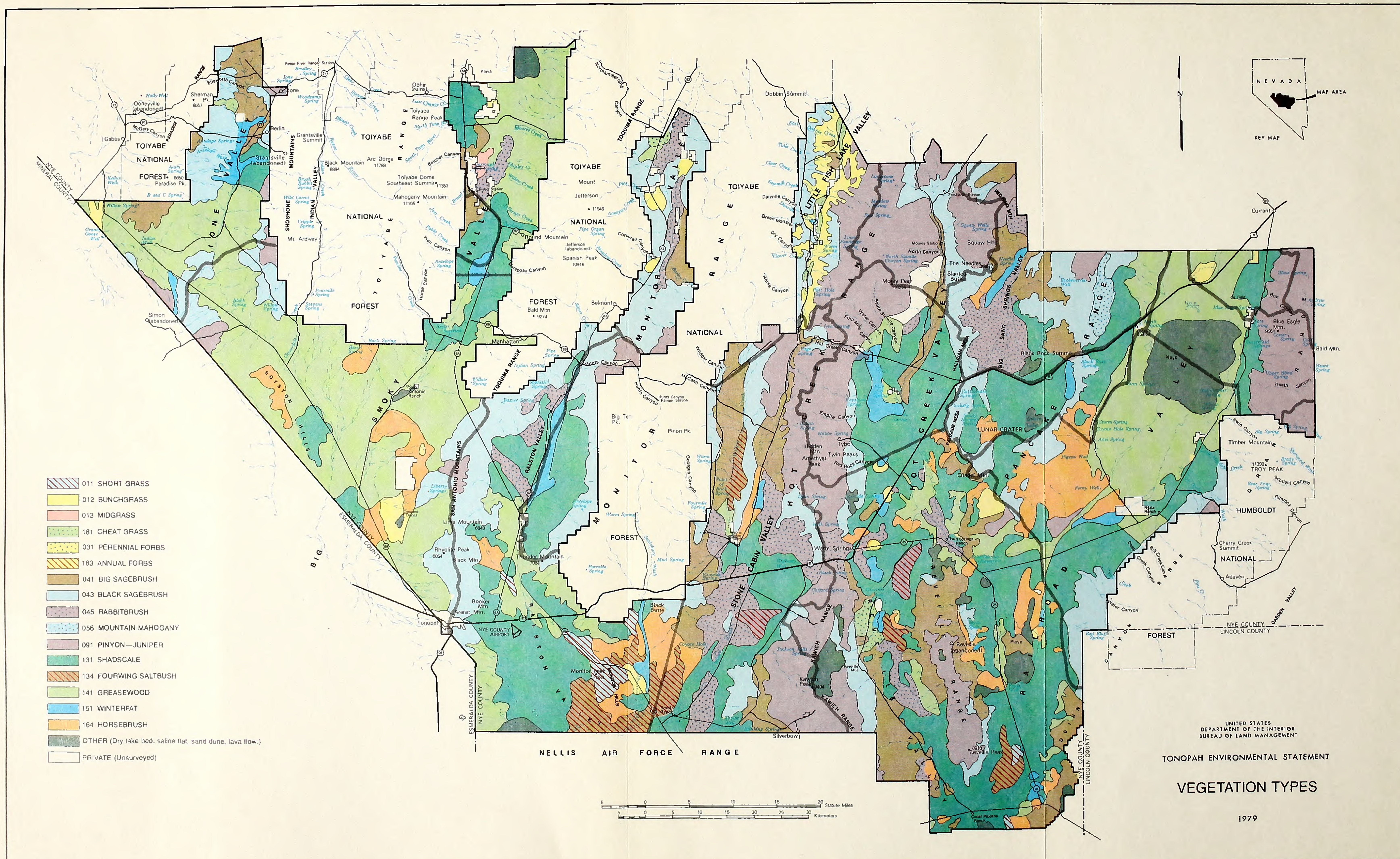


MORE THAN 16 INCHES
8 TO 16 INCHES
4 TO 8 INCHES
SOURCE: "Nevada's Weather and Climate" by Houghton, Sakamoto, and Gifford.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
AVERAGE ANNUAL PRECIPITATION
1979
NEVADA
MAP AREA
KEY MAP
N
Statute Miles
Kilometers
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
TOIYABE NATIONAL FOREST
MONITOR NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
TOIYABE RANGE
TOQUIMA RANGE
MONITOR RANGE
SHOSHONE MOUNTAINS
SAN ANTONIO MOUNTAINS
HOT CREEK RANGE
REVEILLE RANGE
KAWICH RANGE
PANCAKE RANGE
GRANT RANGE
QUINN CANYON RANGE
ROYSTON HILLS
MONITOR HILLS
BIG SMOKY VALLEY
IONE VALLEY
RALSTON VALLEY
MONITOR VALLEY
STONE CABIN VALLEY
HOT CREEK VALLEY
LITTLE FISH LAKE VALLEY
BIG SAND SPRINGS VALLEY
RAILROAD VALLEY
REVEILLE VALLEY
GARDEN VALLEY
Tonopah
Gabbs
Ione
Berlin
Manhattan
Belmont
Tybo
Warm Springs
Currant
Reveille (abandoned)
Silverbow
Adaven
Lunar Crater
NYE COUNTY AIRPORT

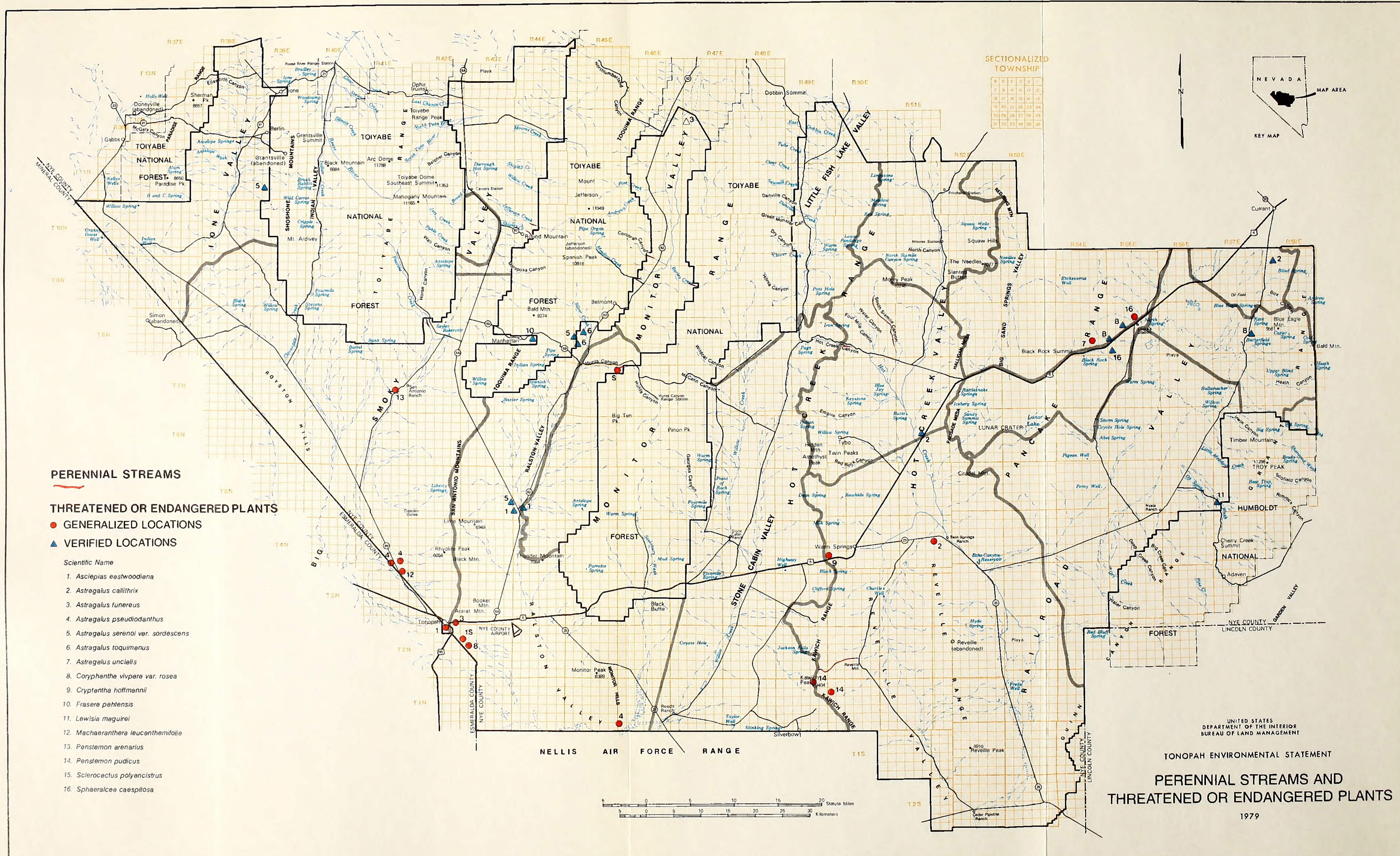

052 BLUE EAGLE
050 CRATER-BLACKROCK
048 HOT CREEK
043 HUNTS CANYON
039 IONE
044 MONITOR
047 MOREY
051 NYALA
042 RALSTON
006 REVEILLE
040 SAN ANTONIO
049 SAND SPRINGS
041 BIG SMOKY
046 STONE CABIN
045 WAGON JOHNNIE
004 KAWICH
005 LOWER HOT CREEK
007 LOWER RAILROAD VALLEY
WATERSHED BOUNDARIES
RAILROAD VALLEY
4th ORDER RECONNAISANCE SURVEY
BIG SMOKY VALLEY
3rd ORDER SOIL SURVEY
TONOPAH
3rd ORDER BLOCK SOIL SURVEYS (9 blocks)
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
Tonopah
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
WATERSHED BOUNDARIES AND
SOIL SURVEY LOCATIONS
1979

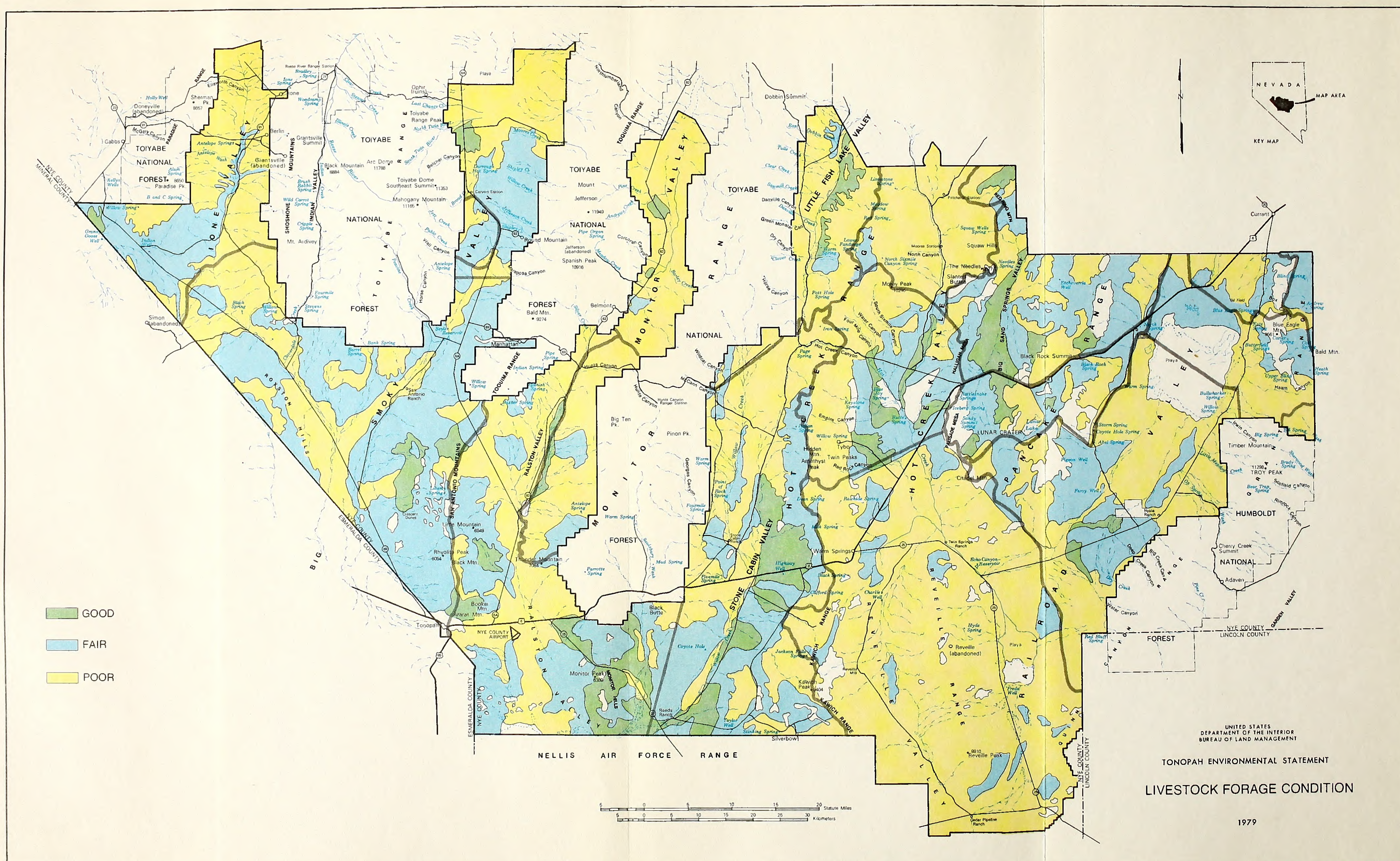

SHALLOW TO DEEP, STONY SOILS OF MODERATELY STEEP TO VERY STEEP UPLANDS AND MOUNTAINS (HAPLOXEROLLS-ARGIXEROLLS-HAPLARGIDS-ROCK OUTCROPS.)
SHALLOW TO DEEP SOILS OF GENTLY SLOPING TO MODERATELY STEEP DISSECTED FANS, PEDIMENTS AND FOOTHILLS (DURARGIDS-CAMBORTHIDS-DURORTHIDS-HAPLARGIDS.)
DEEP SOILS OF GENTLY SLOPING, SMOOTH ALLUVIAL FANS, APRONS AND TOESLOPES (CAMBORTHIDS-TORRIORTHENTS-HAPLARGIDS-TORRIPSAMMENTS.)
SHALLOW TO DEEP SOILS OF NEARLY LEVEL TO GENTLY SLOPING, SMOOTH ALLUVIAL FANS, VALLEY FILLS AND OUTWASH PLAINS (NATRARGIDS-NADURARGIDS-TORRIORTHENTS.)
SALINE SOILS OF LAKE BASINS (CALCIORTHIDS-CALCIAQUOLLS-HALAQUEPTS-TORRIORTHENTS.)
PLAYAS
NEVADA
MAP AREA
KEY MAP
N
Statute Miles
Kilometers
NELLIS AIR FORCE RANGE
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NYE COUNTY
LINCOLN COUNTY
ESMERALDA COUNTY
MINERAL COUNTY
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
GENERAL SOILS ASSOCIATION
1979

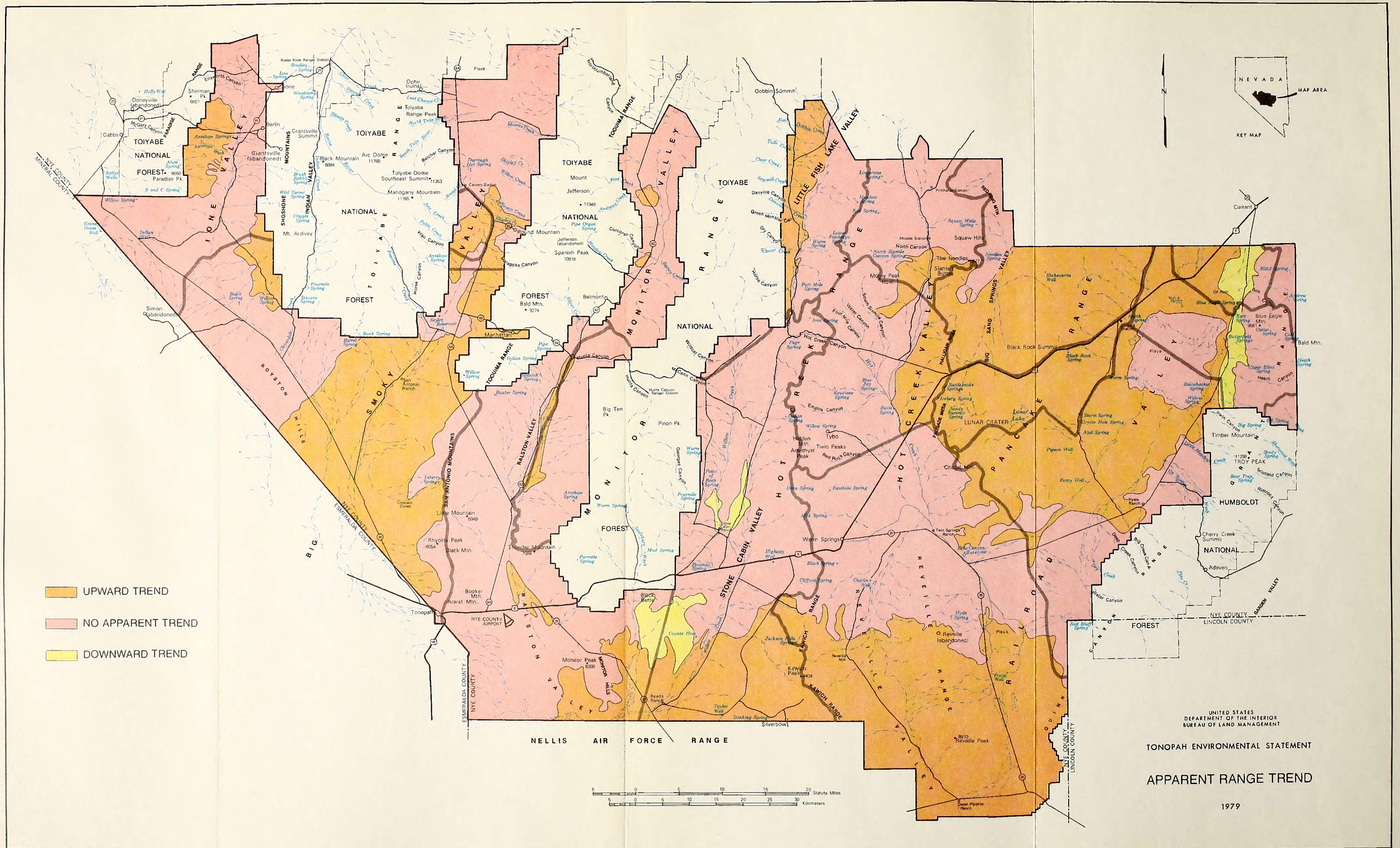

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
PRESENT WATERSHED
EROSION CONDITION
1979
EROSION CONDITION CLASS
SOIL SURFACE FACTOR (SSF)
STABLE 0 - 20
SLIGHT 21 - 40
MODERATE 41 - 60
CRITICAL 61 - 80
UNCLASSIFIED UNCOLORED
NEVADA
MAP AREA
KEY MAP
N
Statute Miles
Kilometers
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
IONE VALLEY
SHOSHONE MOUNTAINS
TOIYABE RANGE
BIG SMOKY VALLEY
ROYSTON HILLS
SAN ANTONIO MOUNTAINS
RALSTON VALLEY
TOQUIMA RANGE
MONITOR VALLEY
MONITOR RANGE
STONE CABIN VALLEY
HOT CREEK RANGE
HOT CREEK VALLEY
LITTLE FISH LAKE VALLEY
PANCAKE RANGE
RAILROAD VALLEY
REVEILLE RANGE
REVEILLE VALLEY
KAWICH RANGE
SAND SPRINGS VALLEY
GRANT RANGE
Tonopah
Manhattan
Belmont
Round Mountain
LUNAR CRATER
Warm Springs
Tybo
Currant
Gabbs
Ione
Berlin
Silverbow
Reveille (abandoned)
Kawich Peak
Monitor Peak
Troy Peak
Timber Mountain
Cherry Creek Summit
Adaven
NYE COUNTY AIRPORT



011 SHORT GRASS
012 BUNCHGRASS
013 MIDGRASS
181 CHEAT GRASS
031 PERENNIAL FORBS
183 ANNUAL FORBS
041 BIG SAGEBRUSH
043 BLACK SAGEBRUSH
045 RABBITBRUSH
056 MOUNTAIN MAHOGANY
091 PINYON—JUNIPER
131 SHADSCALE
134 FOURWING SALTBUSH
141 GREASEWOOD
151 WINTERFAT
164 HORSEBRUSH
OTHER (Dry lake bed, saline flat, sand dune, lava flow.)
PRIVATE (Unsurveyed)
NEVADA
MAP AREA
KEY MAP
NELLIS AIR FORCE RANGE
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
VEGETATION TYPES
1979


PERENNIAL STREAMS
THREATENED OR ENDANGERED PLANTS
GENERALIZED LOCATIONS
VERIFIED LOCATIONS
Scientific Name
1. Asclepias eastwoodiana
2. Astregalus callithrix
3. Astragalus funereus
4. Astregalus pseudiodanthus
5. Astregalus serenoi ver. sordescens
6. Astragalus toquimenus
7. Astregelus uncielis
8. Coryphanthe vivpere var. rosea
9. Cryptentha hoffmennil
10. Frasere pehtensis
11. Lewisia meguirei
12. Machaeranthera leucenthemifolie
13. Penstemon arenarius
14. Penstemon pudicus
15. Sclerocectus polyencistrus
16. Sphaeralcee caespitosa
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
Tonopah
NYE COUNTY AIRPORT
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
PERENNIAL STREAMS AND
THREATENED OR ENDANGERED PLANTS
1979


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
LIVESTOCK FORAGE CONDITION
1979
GOOD
FAIR
POOR
NEVADA
MAP AREA
KEY MAP
Statute Miles
Kilometers
TOIYABE NATIONAL FOREST
TOIYABE RANGE
MONITOR RANGE
TOQUIMA RANGE
MONITOR VALLEY
IONE VALLEY
SMOKY VALLEY
RALSTON VALLEY
STONE CABIN VALLEY
HOT CREEK VALLEY
HOT CREEK RANGE
LITTLE FISH LAKE VALLEY
REVEILLE RANGE
REVEILLE VALLEY
RAILROAD VALLEY
PANCAKE RANGE
KAWICH RANGE
SAN ANTONIO MOUNTAINS
SHOSHONE MOUNTAINS
ROYSTON HILLS
BIG SMOKY VALLEY
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah
Manhattan
Belmont
Warm Springs
Currant
Lunar Crater
Tybo
Reveille (abandoned)
Reveille Peak
Nye County Airport


UPWARD TREND
NO APPARENT TREND
DOWNWARD TREND
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
APPARENT RANGE TREND
1979
NEVADA
MAP AREA
KEY MAP
N
Statute Miles
Kilometers
TOIYABE NATIONAL FOREST
TOIYABE RANGE
TOQUIMA RANGE
MONITOR RANGE
MONITOR VALLEY
SHOSHONE MOUNTAINS
IONE VALLEY
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STONE CABIN VALLEY
HOT CREEK RANGE
HOT CREEK VALLEY
LITTLE FISH LAKE VALLEY
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REVEILLE RANGE
REVEILLE VALLEY
KAWICH RANGE
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GRANT RANGE
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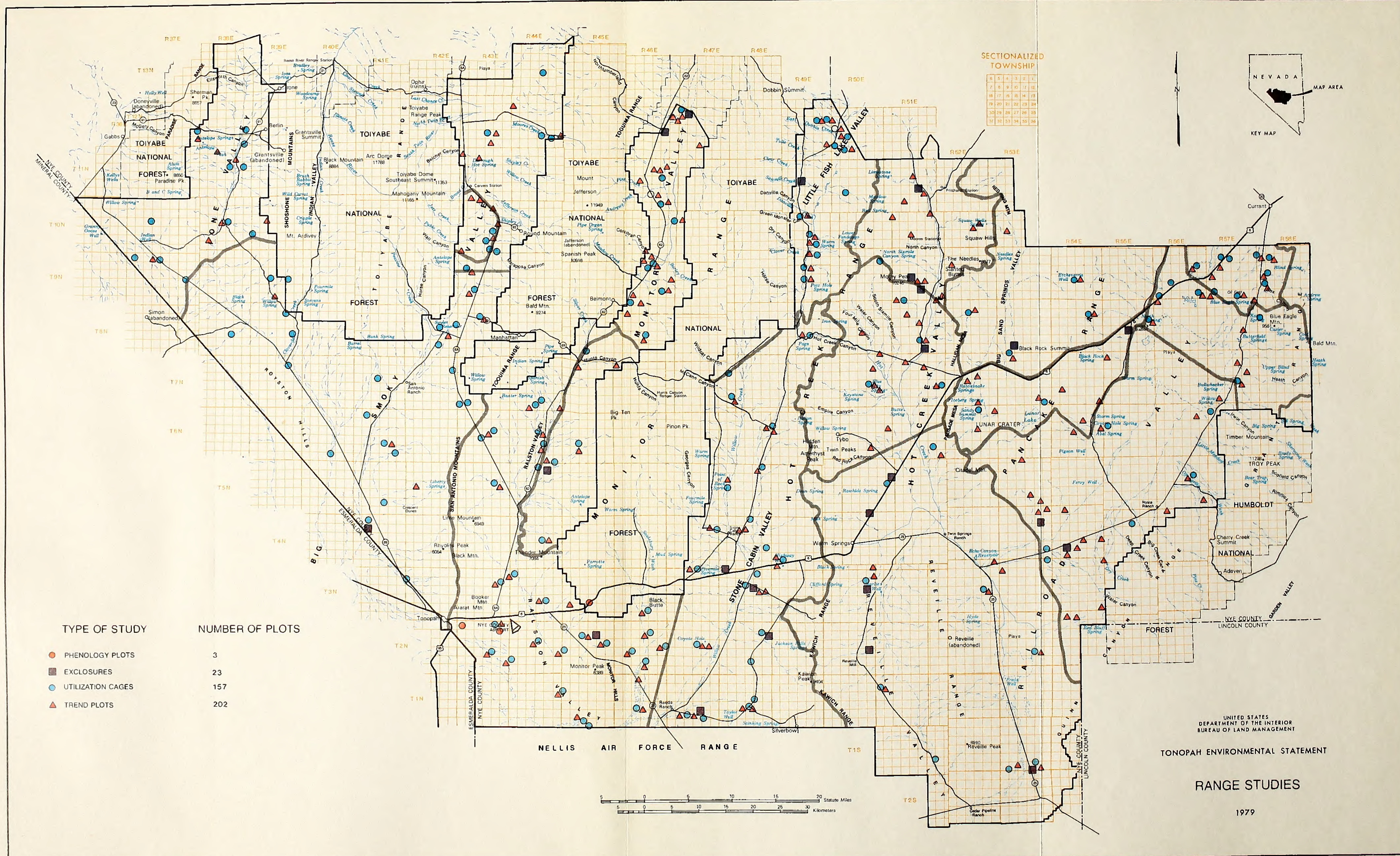
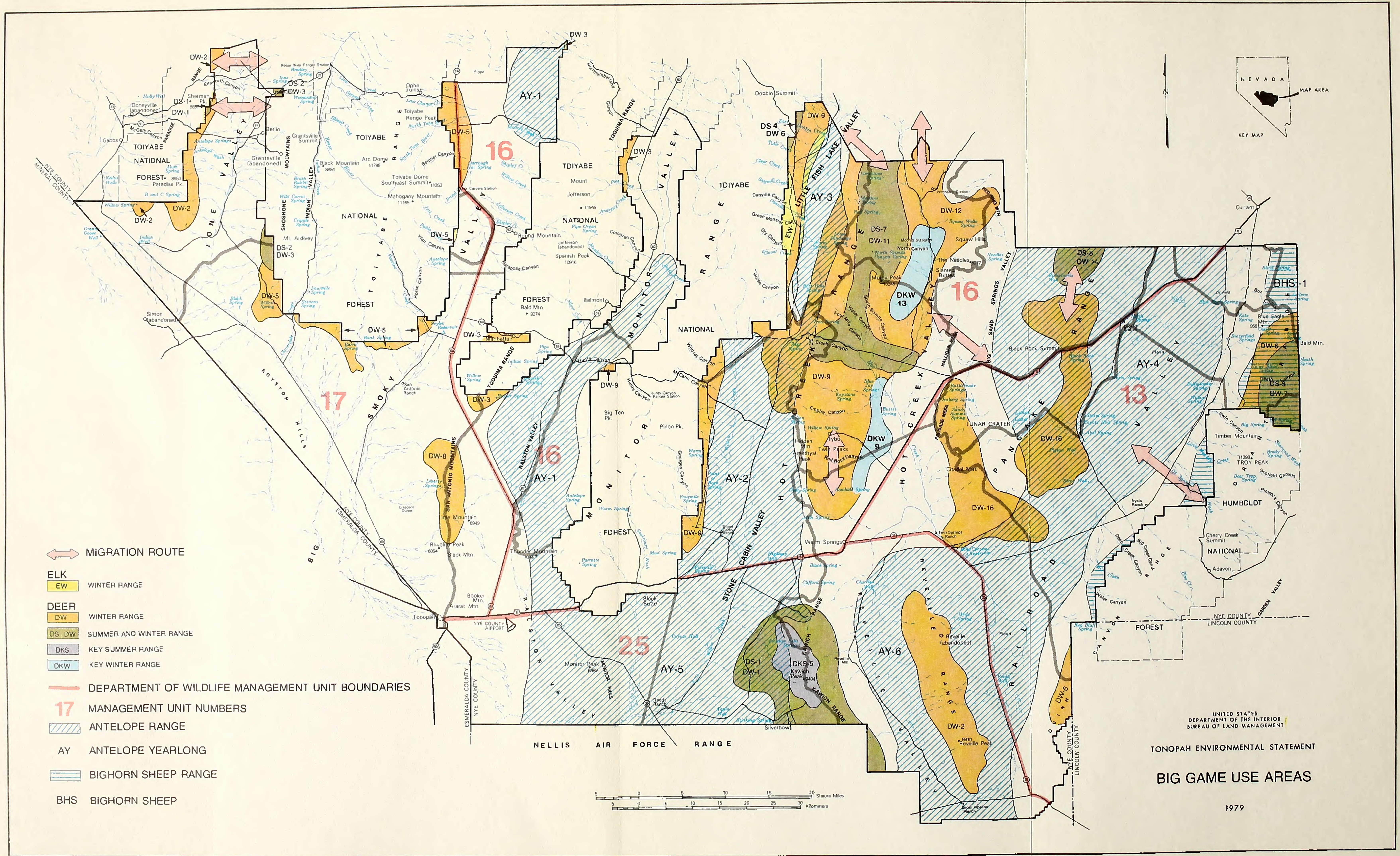
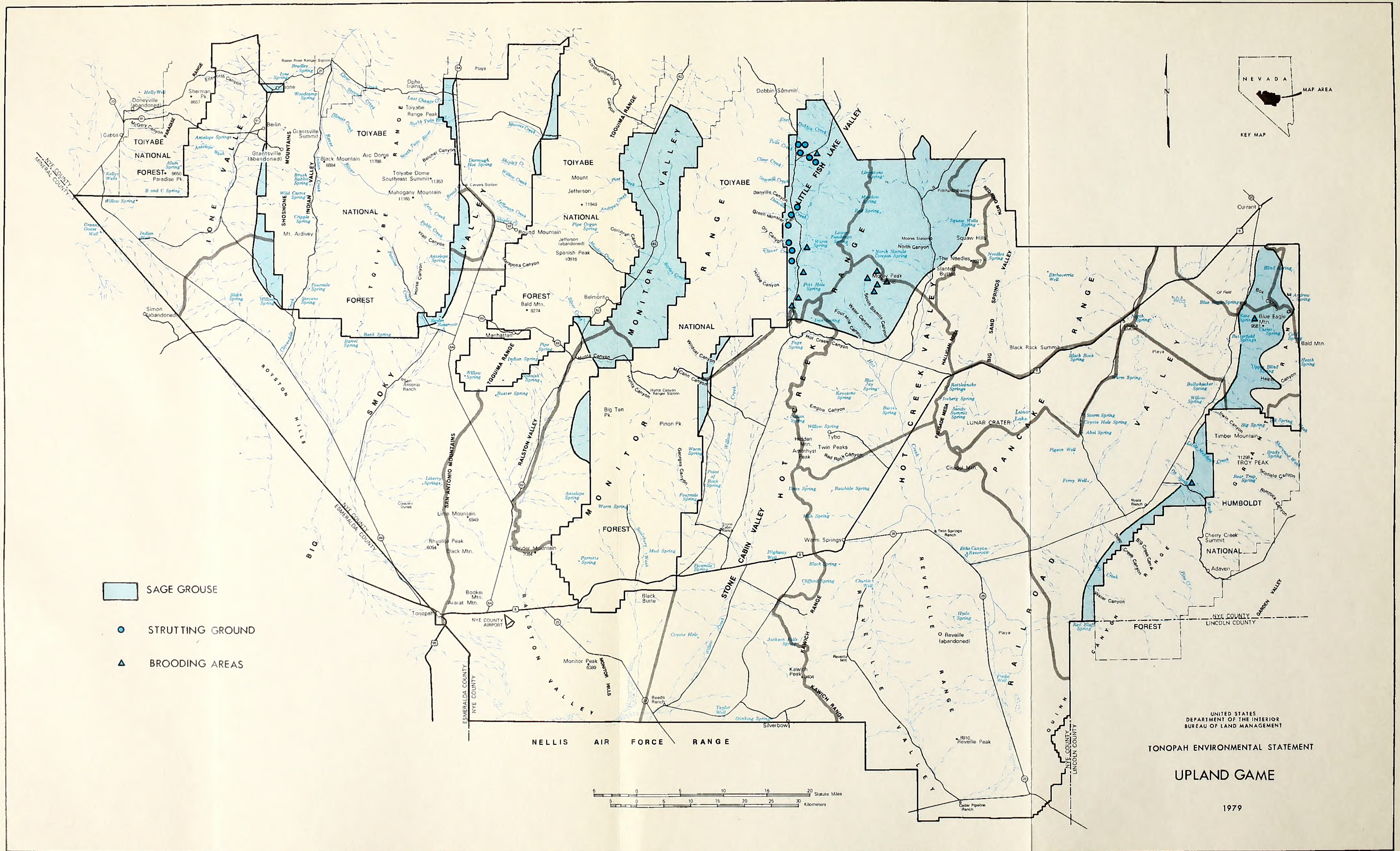
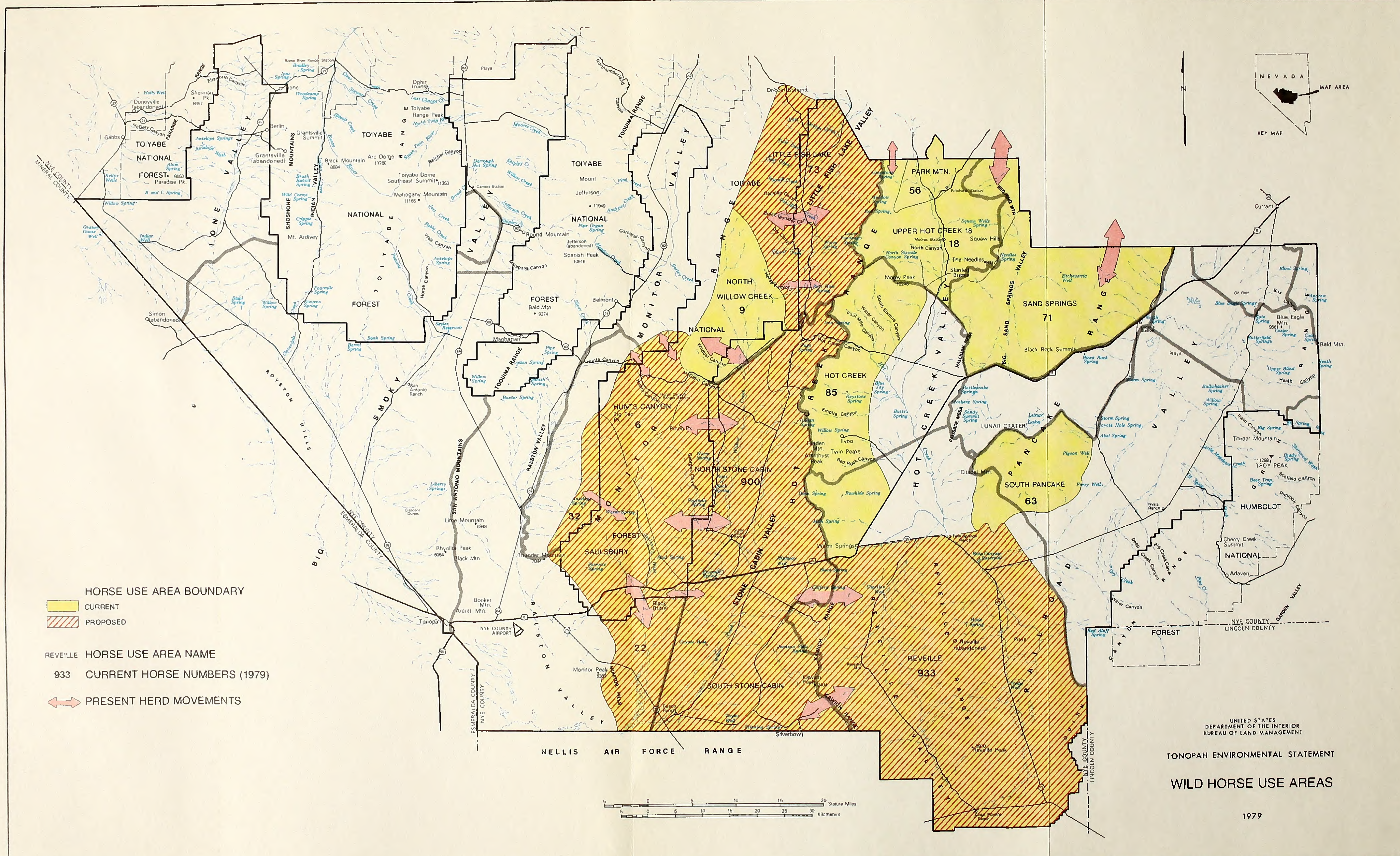
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah
NYE COUNTY AIRPORT
Manhattan
Belmont
Berlin
Ione
Gabbs
Warm Springs
Tybo
LUNAR CRATER
Currant
Black Rock Summit
Twin Peaks
Reveille (abandoned)
Reeds Ranch
Silverbow
Monitor Peak
Timber Mountain
TROY PEAK
Adaven
Cherry Creek Summit
Arc Dome
Mt. Jefferson
Bald Mtn.
Little Mountain
Rhyolite Peak
Black Mtn.
Thunder Mountain
Booker Mtn.
Ararat Mtn.
Kawich Peak
Reveille Peak
Simon (abandoned)
Grantsville (abandoned)
Paradise Pk.
Sherman Pk.
Big Ten Pk.
Pinon Pk.
Moody Peak
Squaw Hills
Lunar Lake
Citadel Mtn.
Hidden Mtn.
Amethyst Peak
Blue Eagle Mtn.
Black Butte
Coyote Hole
Playa

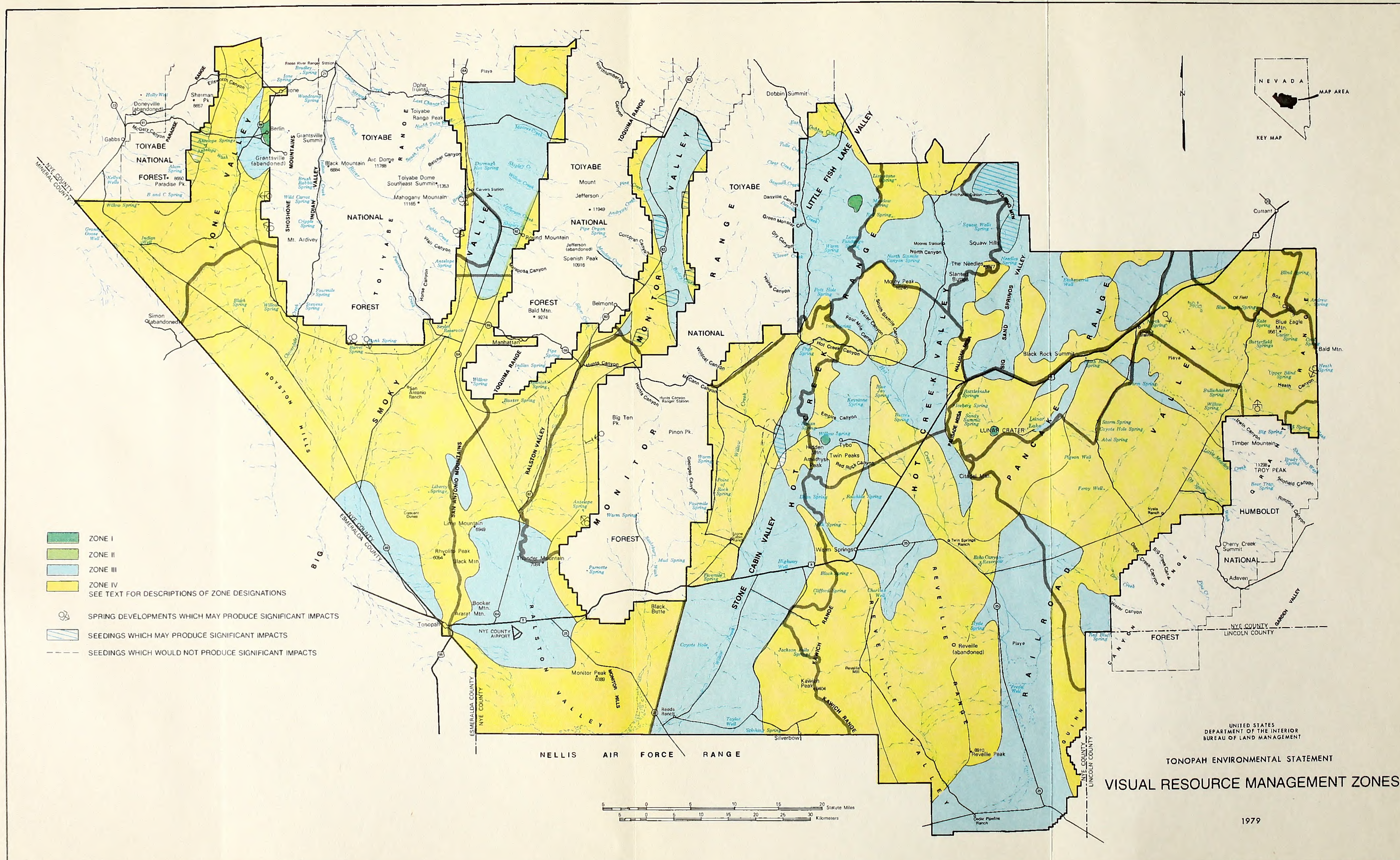

TYPE OF STUDY
NUMBER OF PLOTS
PHENOLOGY PLOTS 3
EXCLOSURES 23
UTILIZATION CAGES 157
TREND PLOTS 202
SECTIONALIZED TOWNSHIP
NEVADA
MAP AREA
KEY MAP
N
TOIYABE NATIONAL FOREST
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah
Statute Miles
Kilometers
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
RANGE STUDIES
1979


MIGRATION ROUTE
ELK
EW WINTER RANGE
DEER
DW WINTER RANGE
DS DW SUMMER AND WINTER RANGE
DKS KEY SUMMER RANGE
DKW KEY WINTER RANGE
DEPARTMENT OF WILDLIFE MANAGEMENT UNIT BOUNDARIES
17 MANAGEMENT UNIT NUMBERS
ANTELOPE RANGE
AY ANTELOPE YEARLONG
BIGHORN SHEEP RANGE
BHS BIGHORN SHEEP
NEVADA
MAP AREA
KEY MAP
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
BIG GAME USE AREAS
1979
Statute Miles
Kilometers
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
NELLIS AIR FORCE RANGE
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
Tonopah
16
17
25
13
AY-1
AY-2
AY-3
AY-4
AY-5
AY-6
DW-2
DW-3
DW-5
DW-8
DW-9
DW-12
DW-16
DKW 13
DKW 9
DKS-5
DS-1 DW-1
DS-7 DW-11
BHS-1
SMOKY VALLEY
MONITOR VALLEY
RALSTON VALLEY
HOT CREEK VALLEY
STONE CABIN VALLEY
REVEILLE VALLEY
RAILROAD VALLEY
LITTLE FISH LAKE VALLEY
IONE VALLEY
TOQUIMA RANGE
MONITOR RANGE
HOT CREEK RANGE
REVEILLE RANGE
KAWICH RANGE
PANCAKE RANGE
SAN ANTONIO MOUNTAINS
ROYSTON HILLS
Lunar Crater
Troy Peak
Reveille Peak

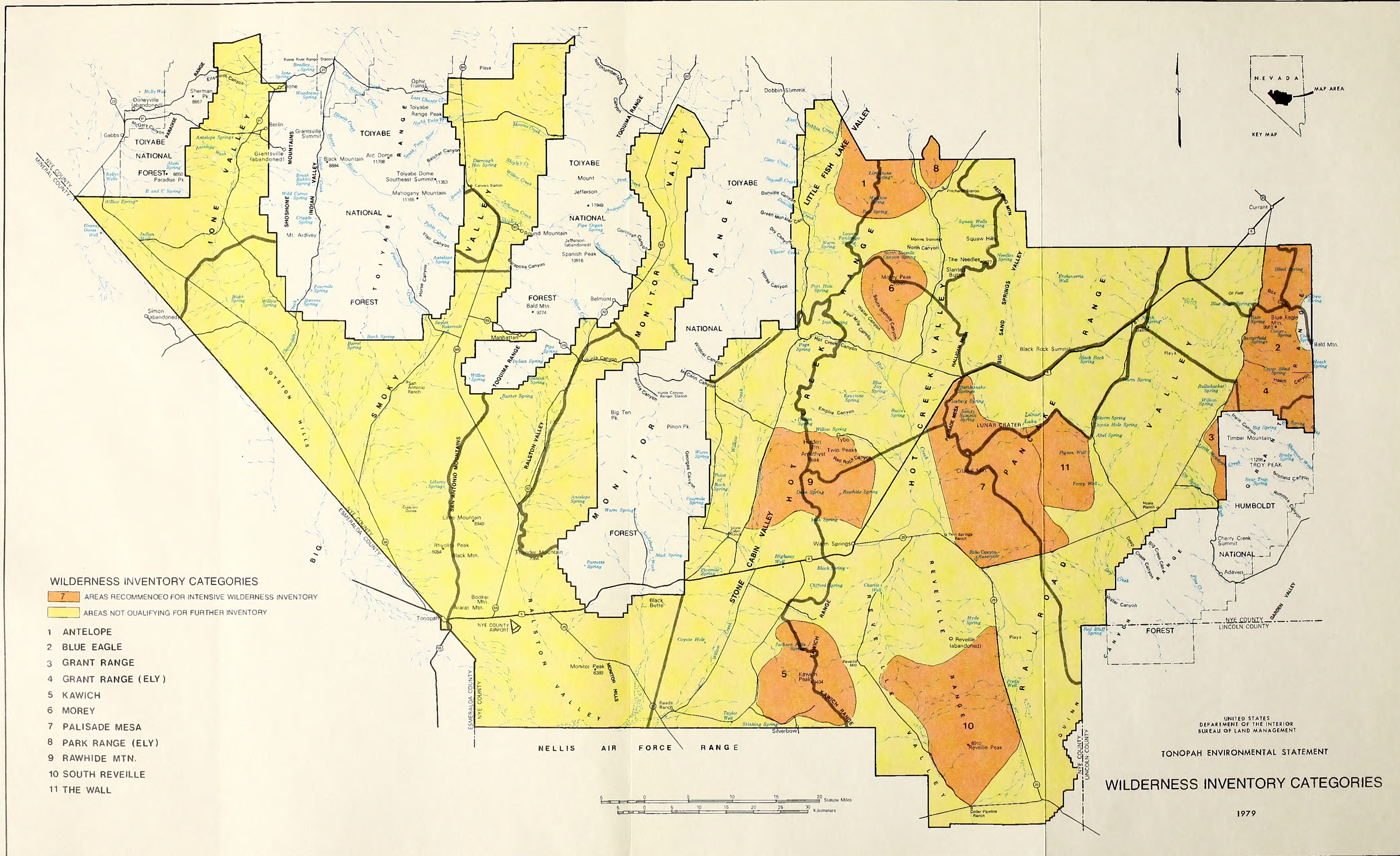

SAGE GROUSE
STRUTTING GROUND
BROODING AREAS
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
UPLAND GAME
1979
NEVADA
MAP AREA
KEY MAP
Statute Miles
Kilometers
TOIYABE NATIONAL FOREST
TOIYABE RANGE
MONITOR RANGE
TOQUIMA RANGE
LITTLE FISH LAKE VALLEY
MONITOR VALLEY
SMOKY VALLEY
IONE VALLEY
RALSTON VALLEY
STONE CABIN VALLEY
HOT CREEK RANGE
HOT CREEK VALLEY
RAILROAD VALLEY
REVEILLE RANGE
REVEILLE VALLEY
PANCAKE RANGE
KAWICH RANGE
SAN ANTONIO MOUNTAINS
SHOSHONE MOUNTAINS
ROYSTON HILLS
MONITOR HILLS
BIG SMOKY VALLEY
HUMBOLDT NATIONAL FOREST
GRANT RANGE
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah
NYE COUNTY AIRPORT
Manhattan
Belmont
Berlin
Ione
Gabbs
Warm Springs
Tybo
Currant
Silverbow
LUNAR CRATER
Morey Peak
Blue Eagle Mtn.
TROY PEAK
Timber Mountain
Reveille Peak
Kawich Peak
Monitor Peak
Toiyabe Dome
Mahogany Mountain
Arc Dome
Bald Mtn.
Black Rock Summit
Cherry Creek Summit
Cedar Pipeline Ranch



HORSE USE AREA BOUNDARY
CURRENT
PROPOSED
REVEILLE HORSE USE AREA NAME
933 CURRENT HORSE NUMBERS (1979)
PRESENT HERD MOVEMENTS
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
WILD HORSE USE AREAS
1979
NEVADA
MAP AREA
KEY MAP
Statute Miles
Kilometers
LITTLE FISH LAKE
73
PARK MTN.
56
UPPER HOT CREEK 18
18
NORTH WILLOW CREEK
9
SAND SPRINGS
71
HOT CREEK
85
HUNTS CANYON
6
NORTH STONE CABIN
900
SOUTH PANCAKE
63
SAULSBURY
32
22
SOUTH STONE CABIN
REVEILLE
933
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NELLIS AIR FORCE RANGE
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
Tonopah



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
VISUAL RESOURCE MANAGEMENT ZONES
1979
ZONE I
ZONE II
ZONE III
ZONE IV
SEE TEXT FOR DESCRIPTIONS OF ZONE DESIGNATIONS
SPRING DEVELOPMENTS WHICH MAY PRODUCE SIGNIFICANT IMPACTS
SEEDINGS WHICH MAY PRODUCE SIGNIFICANT IMPACTS
SEEDINGS WHICH WOULD NOT PRODUCE SIGNIFICANT IMPACTS
Statute Miles
Kilometers
NEVADA
MAP AREA
KEY MAP
N
NELLIS AIR FORCE RANGE
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
NYE COUNTY
MINERAL COUNTY
ESMERALDA COUNTY
LINCOLN COUNTY
IONE VALLEY
SMOKY VALLEY
MONITOR VALLEY
RALSTON VALLEY
STONE CABIN VALLEY
HOT CREEK VALLEY
LITTLE FISH LAKE VALLEY
RAILROAD VALLEY
REVEILLE VALLEY
PANCAKE RANGE
HOT CREEK RANGE
REVEILLE RANGE
KAWICH RANGE
MONITOR RANGE
TOQUIMA RANGE
SAN ANTONIO MOUNTAINS
ROYSTON HILLS
Tonopah
Manhattan
Belmont
Warm Springs
Tybo
LUNAR CRATER


WILDERNESS INVENTORY CATEGORIES
7 AREAS RECOMMENDED FOR INTENSIVE WILDERNESS INVENTORY
AREAS NOT QUALIFYING FOR FURTHER INVENTORY
1 ANTELOPE
2 BLUE EAGLE
3 GRANT RANGE
4 GRANT RANGE (ELY)
5 KAWICH
6 MOREY
7 PALISADE MESA
8 PARK RANGE (ELY)
9 RAWHIDE MTN.
10 SOUTH REVEILLE
11 THE WALL
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
TONOPAH ENVIRONMENTAL STATEMENT
WILDERNESS INVENTORY CATEGORIES
1979
NELLIS AIR FORCE RANGE
KEY MAP
NEVADA
MAP AREA
Statute Miles
Kilometers
TOIYABE NATIONAL FOREST
HUMBOLDT NATIONAL FOREST
Tonopah
NYE COUNTY
LINCOLN COUNTY
ESMERALDA COUNTY
MINERAL COUNTY

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter of the EIS discusses the "significant impacts" that would result from implementation of the proposed action and each of the alternatives. Both the beneficial and adverse impacts affecting the environmental components, as discussed in Chapter 2, will be documented. This chapter will also include: mitigating measures (not included under Standard Operating Procedures of Chapter 1) needed to enhance beneficial impacts or lessen adverse impacts; "unavoidable adverse impacts" which cannot be mitigated; the relationship between "short-term" use and enhancement of "long-term" productivity; and irreversible or irretrievable commitment of resources.

Impacts concerning climate were analyzed and found to be insignificant. No further documentation of this component will appear in the EIS.

Where the subheadings: mitigating measures, unavoidable adverse impacts, short-term use versus long-term productivity, and irreversible and irretrievable commitment of resources do not appear, impacts were considered insignificant and therefore, no discussion was necessary.

BASIC ASSUMPTIONS

Basic assumptions were made to facilitate analysis and to measure the effect of the proposed action and each alternative. These assumptions are:

1) Intensive grazing management plans would be prepared and implemented over a seven year period (1981 through 1987), as discussed in Chapter 1.
2) When intensive grazing plans are initiated, an environmental assessment would be prepared by an interdisciplinary team to analyze the impacts of specific grazing systems and site-specific impacts of livestock support facilities and vegetation manipulations for each allotment.
3) The BLM will have the funding and work force to implement and supervise the proposed intensive grazing management (Allotment Management Plan) and associated livestock support facilities.
4) Short-term impacts are those which would occur during intensive grazing management development (1981 through 1987). Long-term impacts are those projected to occur at the end of 35 years (year 2015).
5) Those impacts which would be mitigated through the Standard Operating Procedures in Chapter 1 will not be discussed in this Chapter.
6) All impacts identified in this chapter are assumed to be direct impacts unless otherwise noted in the narrative as indirect or cumulative impacts.
7) The current wild horse numbers in the Tonopah Resource Area are in excess of Management Framework Plan (MFP) recommended optimum numbers. For analysis purposes, it is assumed that the gathering of excess wild horses would begin before grazing decisions have been issued. To prevent overuse of allotments containing excess wild horses, it would become necessary to temporarily reduce AUMs allocated to livestock until excess horses are removed (Table 3-1).
8) The apparent range trend information may not coincide with the present livestock forage condition or the proposed livestock adjustments in all allotments. Apparent range trend information represents only a single year's observation, therefore, may or may not reflect the actual long-term trend of an area. It was obtained and used for analytical purposes only.
9) The assumptions are that water would be available at attainable depths in areas currently more than four miles from existing water and that the Nevada State Water Engineer will allow a permit for the purpose of developing these water sources.

SOILS

PROPOSED ACTION

IMPACTS

The soils in the Tonopah Resource Area are generally stable. This is evident by the high degree of development that has taken place in the soil (Dollarhide, Soil Conservation Service, personal communication, 1980). About 511,000 acres, 14

TABLE 3-1
TEMPORARILY REDUCED ALLOCATION TO LIVESTOCK
(AUMs)

Affected Allotments	Projected Wild Horse Use a/ 1980	Proposed Wild Horse Use	Excess Wild Horse Use	Proposed Livestock Use	Interim Livestock Use b/
Blue Eagle	0	0	0	1,505	1,505
Butterfield	0	0	0	2,934	2,934
Crater Black Rock	0	0	0	3,348	3,348
Currant Ranch	0	0	0	282	282
Forest Moon	0	0	0	36	36
Francisco	0	0	0	1,114	1,114
Hot Creek	851	0	851	4,434	3,583
Hunts Canyon	216	90	126	2,821	2,695
Ione	0	0	0	10,776	10,776
Monitor	13	12	1	3,063	3,062
Morey	959	0	959	815	0 c/
Nyala	580	0	580	12,029	11,449
Ralston	148	60	88	14,098	14,010
Reveille	13,163	3,780	9,383	25,730	16,347
San Antone	0	0	0	10,667	10,667
Sand Springs	999	0	999	9,556	8,557
Smoky	0	0	0	5,821	5,821
Stone Cabin	12,285	2,700	9,585	12,664	3,079
Wagon Johnnie	891	600	291	4,359	4,068
Willow Creek	61	0	61	338	277
TOTAL	30,166	7,242	22,924	126,390	103,610

a/ Annual increase in wild horse use is 12.5 percent; see Appendix C, Methodology for Computing Annual Increases in Wild Horses.

b/ This is the proposed level of livestock use that will be required to accomodate wild horse use until the time wild horses are removed.

c/ The wild horse use in the Morey allotment is currently 144 AUMs in excess of the proposed AUMs alloted to livestock.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Wild Horse Inventory files and Range Survey files, 1979.

percent of the area, have high to moderately high potential for water erosion. About 225,000 acres, 6 percent of the area, have a high potential for wind erosion. The remaining 288,733 acres, 80 percent of the area, have a moderate to slight erosion potential (USDI, BLM, Battle Mountain District, "Soil Interpretation and Properties Table." 1976).

Soil erosion can be changed by grazing systems (USDA, *Agriculture Handbook* No. 537, 1978). The proposed action would increase ground cover and reduce the erosion rate (Soil Conservation Service, Universal Soil Loss Equation, Technical Note 50, 1977). Erosion rates range from 1.33 tons per acre per year to about zero on the lake beds. Resource area wide, this cumulative long-term effect would be a reduction in soil erosion from .78 tons per acre per year to .65 tons per acre per year (Table 3-2). Both of these erosion rates are well below the three to five tons per acre per year limit set by the Soil Conservation Service (SCS) for Nevada (Hall, SCS, personal communication, 1980).

Range improvements, such as fences, springs, and pipelines, would increase erosion as they denude the soil. Because this amounts to about 1,000 acres, .03 percent, in the short-term and less than 141 acres, .004 percent, in the long-term, this erosion is considered to be insignificant to the total resource area.

Range treatments, spraying or burning and reseeding, are proposed for 35,205 acres, about 1 percent of the resource area (Range Facilities and Land Treatments–Proposed Action and Alternatives Map). The average erosion rate of the proposed burn areas in Ione, Sand Springs, and Stone Cabin allotments (18,800 acres) is .66 tons per acre per year. If the areas were burned there would be a short-term direct impact of increasing the erosion rate to .85 tons per acre per year. Two years after the proposed reseeding the erosion rate would drop to a long-term level of .59 tons per acre per year. The average erosion rate on the proposed spray sites in Monitor and Stone Cabin allotments (16,405 acres) is .82 tons per acre per year. No short-term increase in erosion rate would occur. The average erosion rate after seeding establishment would be .75 tons per acre per year. Because all erosion rates are below the three to five tons per acre per year limit set by the SCS, range treatments are considered to have an insignificant impact on the soils of the treated areas. For an identification of potential ranges or extremes see Table 3-3.

The erosion rates were calculated using Phase I Watershed Conservation and Development Inventory (Phase I WC&DI) and the Pacific Southwest Inter-Agency Committee (PSIAC) method for determining sediment yield.

Conclusion

The proposed action would not have a significant impact on the soils resource. The short-term impact on the proposed burn areas is an increase in erosion rate from .66 to .85 tons per acre per year from the time of the burn until vegetation establishment. Long-term impacts on burn and spray treatment areas would be a net decrease in the erosion rates from .66 to .59 and .82 to .75 tons per acre per year, respectively. The long-term impact for the Tonopah Resource Area would be a decrease in the erosion rate from .78 to .65 tons per acre per year.

NO ACTION ALTERNATIVE

IMPACTS

If this alternative were implemented three watershed areas (039, 047, 048) would erode in excess of one ton per acre per year (Table 3-2). Under this alternative the long-term impact for the Tonopah Resource Area would be an increased erosion rate from .78 to .84 tons per acre per year because of decreased ground cover. The erosion rates were calculated using Phase I WC&DI and the PSIAC method for determining sediment yield. This alternative is considered to have an insignificant impact on the soil resource, as the erosion rates are below the SCS limit of three to five tons per acre per year.

UNAVOIDABLE ADVERSE IMPACTS

Under this alternative the erosion rate would increase from .78 to .84 tons per acre per year. This is an increase of .06 tons per acre per year but it is still below the SCS limit.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

If this alternative were implemented, it would not be significantly different from the proposed action. There would be no range improvements and no range treatments. The long-term impact would be a decrease in the erosion rate from .78 to .65 tons per acre per year; see Table 3-2. The erosion rates were calculated using Phase I WC&DI and the PSIAC method for determining sediment yield. This alternative is considered to have an insignificant

TABLE 3-2
PRESENT AND PROJECTED EROSION RATES a/
(Tons/Acre/Year)

No. Watershed Name b/	Present Erosion	Proposed c/ Action	No c/ Action	No Livestock c/ Grazing	Livestock c/ Reduction
004 Kawich	.90	.90	.90	.90	.90
005 Lower Hot Creek	.61	.58	.65	.58	.61
006 Reveille	.70	.67	.71	.67	.67
007 Lower Railroad Valley	.61	.58	.65	.58	.61
039 Ione	.94	.87	1.0	.87	.87
040 San Antone	.71	.70	.83	.70	.70
041 Big Smoky	.71	.64	.77	.64	.64
042 Ralston	.56	.53	.62	.53	.53
043 Hunts Canyon	.71	.67	.78	.67	.67
044 Monitor	.83	.76	.89	.76	.76
045 Wagon Johnnie	.97	.84	.99	.84	.97
046 Stone Cabin	.77	.72	.84	.72	.77
047 Morey	.98	.97	1.09	.97	.98
048 Hot Creek	.94	.84	1.01	.84	.94
049 Sand Springs	.65	.59	.68	.59	.65
050 Crater Black Rock	.61	.58	.63	.58	.58
051 Nyala	.74	.72	.79	.72	.72
052 Blue Eagle	.89	.86	.92	.86	.86
Average	.78	.65	.84	.65	.76

a/ Refers to the Tonopah Resource Area.

b/ Watershed area boundaries do not necessarily correspond with allotment boundaries. See Watershed Boundaries and Soil Survey Locations map.

c/ Projected long-term effect.

d/ Represents a weighed average.

Source: Phase I Watershed Conservation and Development Inventory Data figured using PSIAC method of computing soil loss (Appendix E), 1979.

TABLE 3-3
LAND TREATMENT SUITABILITY a/

Allotment	Acreage	Treatment	Erosion Susceptability	Slope (%)	Seeding Suitability c/	Rates of Erosion (Tons/Acre/Year) b/ Present Erosion	Short-Term Erosion d/	Long-Term Erosion e/
Ione	2,400	Burn	Moderate	3-8	Poor	.78	.84	.74
Monitor								
Site 1	2,530	Spray e/	Slight	0-8	Fair	.81	.81	.74
Site 2	742	Spray	Slight	0-8	Fair	.97	.97	.81
Site 3	1,667	Spray	Slight	0-3	Fair	1.27	1.27	1.15
Site 4	1,954	Spray	Slight	0-3	Fair	.65	.65	.61
Site 5	846	Spray	Slight	0-8	Fair	1.33	1.33	1.08
Site 6	986	Spray	Moderate	0-8	Poor	1.10	1.10	1.10
Sand Springs	10,000	Burn e/	Slight	0-8	Poor	.64	.93	.59
Stone Cabin	6,400	Burn e/	Moderate	0-4	Poor	.65	.73	.52
	7,680	Spray	Slight	0-3	Poor	.68	.68	.61
TOTAL	35,205							

a/ Refers to the Tonopah Resource Area.

b/ Phase I Watershed Conservation and Development inventory data figures using PSIAC method of computing soil loss. See Appendix E.

c/ Analyzed using the source below, General Soils Associations map for the Tonopah EIS, and Phase I Watershed Data.

d/ Short-term erosion rate is counted from initial treatment to seedling establishment, usually 2-3 years.

e/ Long-term erosion rate is counted from the time of seedling establishment.

Source: Earth Environmental Consultants, Inc., "Soil inventory of Tonopah Range Environmental Impact Statement Area," 1977.

impact on the soil resource, as the erosion rates are below the SCS limit of three to five tons per acre per year.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

If this alternative were implemented, it would not be significantly different than the existing environment. The long-term impact would be a reduction in the erosion rate from .78 to .76 tons per acre per year (Table 3-2). The erosion rate was calculated using Phase I WC&DI and the PSIAC method of determining sediment yield. This alternative is considered to have an insignificant impact on the soil resource, the erosion rates are below the SCS limit of three to five tons per acre per year.

WATER RESOURCES

PROPOSED ACTION

IMPACTS

Water Quantity

Perennial water yield for the Tonopah Resource Area is approximately 143,000 acre feet. Livestock annual water demand is approximately 140 acre feet (Table 2-4) which is about .1 percent of the perennial yield. The 140 acre feet is an insignificant impact on the water quantity for the resource area (Jewell, Bureau of Land Management, personal communication, 1980).

Water Quality

Sedimentation, due to breaking down of the stream bank, and "fecal coliform" are the main impacts on water quality by livestock grazing. Using the water quality sampling data taken in Tonopah and a similar sampling taken in Shoshone-Eureka Resource Area in 1979 (total of 98 sampling sites) it was found that only one sampling site (one percent) failed to meet the recommended fecal coliform standards (USDI, Federal Water Pollution Control Administration (FWPCA), Report of the Committee on Water Quality Criteria, 1968) for recreation water. Using the same data sources, nine sampling sites (nine percent) failed to meet the recommended "turbidity" standards (USDI, FWPCA, 1968) for freshwater organisms. These impacts would not be affected by implementation of the proposed action, as the livestock would continue to use the riparian zones regardless of the livestock numbers or period-of-use (Dahlem 1979; Storch 1979).

The proposed action recommends that 26,405 acres of Monitor and Stone Cabin allotments be sprayed with the herbicide 2,4-D. This would have no impact on water quality because there are no perennial streams in the areas to be treated and because of restrictions required by the BLM and the Environmental Protection Agency (EPA) as outlined in Appendix D, Guidelines for the Use of Herbicides on Public Lands.

Conclusion

Water resources would not be significantly impacted by the proposed action. Water consumed by livestock annually is 140 acre feet or .1 percent of the perennial yield. Water quality would not change. The water quality in areas to be sprayed with 2,4-D would not be impacted because there are no perennial streams in the area to be sprayed and because of regulations by BLM and EPA.

NO ACTION ALTERNATIVE

IMPACTS

This alternative would not have any impacts on the water resources for the reasons stated in impacts of the proposed action. Water quantity and quality would remain as they are described in Chapter 2.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Water quantity would not be impacted because no water would be consumed by livestock. Water quality would improve in the long-term with this alternative. Sedimentation would decrease as streambanks stabilize (Dahlem 1979) and fecal coliform counts would decrease (Buckhouse and Gifford 1976) because the source would be eliminated. Assuming livestock cause the turbidity and all of the fecal coliform, then with the removal of all livestock, water quality would meet the recreation

water and freshwater organisms standards (USDI, FWPCA, 1968). This would be a significant impact that would allow water quality to meet the goals set by the Federal Water Pollution Control Act Amendment of 1972.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

This alternative would not have any impacts on the water resources for the reasons stated in impacts of the proposed action. Water quantity and quality would remain as they are described in Chapter 2.

VEGETATION

PROPOSED ACTION

IMPACTS

Livestock Forage Condition

Changes in livestock forage condition as a result of the proposed action would be attributed to four factors:

1) Allocation of vegetation to livestock, big game, and wild horses so that average utilization of key species would not exceed 50 percent. As a result of this allocation wild horses would be reduced 73 percent from the 1979 level, and livestock would be reduced 26 percent from grazing preference. Litter accumulation would increase as a result of increases in vigor and production (Chapter 2-Vegetation, Existing AMP Evaluation), therefore causing an improvement in livestock forage condition.

2) Implementation of grazing systems with treatments designed to satisfy the physiological needs of the vegetation resources. Grazing systems would allow "plants to recover vigor, seed to ripen, seedlings to become established and litter to accumulate between plants" (Hormay 1970, p. 16). An improvement in livestock forage condition would be realized as a result of improved erosion condition and an increase in the number of desirable forage species.

3) Construction of livestock support facilities to aid in livestock management, thus improving distribution and control. "Good distribution of cattle over rangeland is essential to effective use of the forage resource" (Cook 1967, p. 39). This would result in an increase in desirable species.

4) Manipulation of vegetation would change 35,205 acres from a predominately big sagebrush type to a more desirable species mixture. A 1977 weight-estimate range survey completed on existing seedings in the resource area showed that "carrying capacity" ranged from four to seven acres per AUM. This compares to an average of 60 acres per AUM on the proposed vegetation manipulation sites (Tonopah Range files). Vallentine (1971, p. 201) stated "grass seeding helps to stablize eroding soils since the fibrous roots of grasses hold soil firmly in place." Therefore, based on procedures for determining Livestock Forage Condition, livestock forage condition would improve significantly because of an increase in the number of desirable forage species and a decrease in erosion. See Appendix H, Section 1, Table H-1.

The most significant impact on vegetation as a result of the proposed action over a 35 year period would be an improvement in livestock forage condition: acres in good condition would increase by 863,032 acres, acres in fair condition would increase by 415,961 acres, and acres in poor condition would decrease by 1,278,993 acres. This represents an improvement in 70 percent of the grazing land in the resource area; any improvement over 15 percent would be considered significant. A summary of the change in livestock forage condition is shown in Table 3-4. See Appendix H, Section 1 for methodology in determining change in livestock forage condition.

The improvement in livestock forage condition is a cumulative result of the above actions and would continue over the next 35 years.

Vegetation Production

Available data on estimated vegetation production were inventoried by vegetative type during 1959 to 1964 using the ocular reconnaissance method, BLM Manual 4412, Physical Resource Studies; production was determined by allotment (Table 1-1). Predictions of future available vegetation were based on comparable protected areas, literature review and professional judgement (Appendix A, Section 1). The original adjudication was based on acres per AUM and not on pounds of production per acre. For this reason the discussion

TABLE 3-4
ESTIMATED LIVESTOCK FORAGE CONDITION
(ACRES) a/ b/

Type of Action	Condition Class	Present 1979	Percent	Future 2015	Percent	Change
Proposed Action						
	Good	270,158	7	1,133,190	31	+863,032
	Fair	1,118,887	31	1,534,848	42	+415,961
	Poor	2,096,808	57	817,815	22	-1,278,993
	Unclassified c/	189,721	5	189,721	5	
	TOTAL	3,675,574	100	3,675,574	100	
No Action Alternative	Good	270,158	7	107,566	3	-162,592
	Fair	1,118,887	31	594,104	16	-524,783
	Poor	2,096,808	57	2,784,183	76	+687,375
	Unclassified c/	189,721	5	189,721	5	
	TOTAL	3,675,574	100	3,675,574	100	
No Livestock Grazing Alternative	Good	270,158	7	1,166,716	32	+896,558
	Fair	1,118,887	31	1,531,563	42	+412,676
	Poor	2,096,808	57	787,574	21	-1,309,234
	Unclassified c/	189,721	5	189,721	5	
	TOTAL	3,675,574	100	3,675,0574	100	
Livestock Reduction Alternative	Good	270,158	7	1,022,788	28	+752,630
	Fair	1,118,887	31	1,235,865	34	+116,978
	Poor	2,096,808	57	1,227,200	33	-869,608
	Unclassified c/	189,721	5	189,721	5	
	TOTAL	3,675,574	100	3,675,574	100	

a/ See Appendix H, Tables H-1 to H-4 for acreage by allotment.

b/ Includes private and public lands.

c/ Includes sand dunes, lava flows, dry lakes, and private land.

Source: Present acres taken from Table G-1, future acres taken from Tables H-1, H-2, H-3, and H-4.

in this section is based on changes in AUMs and projected from the following:

1) Spray and seed projects are proposed on 16,405 acres in Stone Cabin and Monitor allotments (Range Facilities and Land Treatments-Proposed Action and Alternatives Map). The significant impact to vegetation as a result of these projects would be a reduction or loss of overstory vegetation transforming the site from a dominant shrub type to dominant grass type (Vallentine 1971). The herbicide, 2,4-D, would reduce the amount of shrub and forb species by approximately 85 percent (Hedrick et al. 1966). The loss of shrub species would result in increased availability of soil moisture for grass species and initial increase in annual species. An estimated 3,033 additional AUMs would result from this treatment (Appendix A, Section 2). Although this increase in production may seem insignificant-less than 15 percent increase in available AUMs-when compared to the entire resource area (2 percent), it represents a significant increase-greater than 15 percent-in available AUMs within the Stone Cabin and Monitor allotments.

2) Burning and seeding in Ione, Stone Cabin, and Sand Springs allotments would have the short-term impact of removing vegetation cover the first year following the burn (18,800 acres). Although this area represents less than one percent of the resource area it would be significant in that 18,800 acres would be transformed from low productive rangeland into highly productive rangeland. Long-term impacts would include a change in species composition toward more grasses. Seeding would have the same impact as under spray and seed. About 3,421 additional AUMs of forage would result in the long-term (Appendix A, Section 2).

3) It is estimated that intensive grazing management would add 14,271 available AUMs by the year 2015. The methodology for the 10 percent increase in future AUMs is shown in Appendix A, Section 2. Van Poollen and Lacey (1979) showed that on western ranges, grazing systems effected a 13 percent increase in mean annual herbage production.

4) Vegetation which is currently more than four miles from water is unallocated to livestock or wild horses. Water would be developed in the short-term in these areas thereby making 14,122 additional AUMs available to livestock and wild horses. Maps showing these areas are in the range files in the Tonopah Resource Area Office.

5) Improvement in erosion condition in areas currently having a Soil Surface Factor greater than 60 would add 822 AUMs by the year 2015.

Vegetative production would be totally lost on 141 acres resulting from construction of livestock support facilities; however, this would be insignificant when compared to the entire resource area. Impacts from livestock support facilities will not be discussed but are shown by allotment in Appendix H, Section 2, Table H-5.

The 1979 available vegetation in the Tonopah Resource Area is 148,458 AUMs with an expected increase to 184,127 AUMs by 2015 (Table 1-2 by allotment). This increase of 35,669 AUMs is the result of several factors mentioned above.

Vegetation Types

Burning and spraying, during the seven year implementation period, with reseeding in Ione, Monitor, Sand Springs, and Stone Cabin allotments would change 35,205 acres (Table 3-3) from big sagebrush type to a grass dominated type (Chapter 1, Proposed Action). Although this represents less than one percent of the Tonopah Resource Area, it would nevertheless be significant because it represents changing 12 percent of the big sagebrush type to a bunch grass type (Table 2-5).

Exclusion of livestock use in North Six-Mile and South Six-Mile Canyons in the Hot Creek and Morey allotments would result in a marked improvement in seven miles of stream and approximately 155 acres of riparian vegetation. A study at Mahogany Creek in Northern Nevada (Dahlem 1979) showed that after two years of livestock exclusion there was a 9 percent improvement in stream bank cover and a 20 percent improvement in stream bank stability. Another study in Rich County, Utah, conducted by Duff (1979, p. 91) showed that with livestock exclusion "vegetation increased 63 percent in 4 years, going from bare, sparsely covered banks to luxuriant, grassy overhanging banks." These studies show that a significant improvement in riparian vegetation can be realized in a short period of time as a result of livestock exclusion.

Controlled livestock use in the Railroad Valley Wildlife Management Area would improve 800 acres of wetland vegetation. This area has been fenced with livestock excluded for two years. Although no studies have been developed to show changes in the vegetation, Wildlife Biologist Kurt Ballantyne (BLM, Elko, personal communication, 1979) stated, "a noticable increase in vegetative production has taken place since cattle were removed." Although this improvement in 955 acres of riparian and wetland vegetation accounts for less

than one percent of the resource area it represents almost half (48 percent) of the total riparian and wetland vegetation in the Tonopah Resource Area. This change would be significant because riparian and wetland vegetation are the most important areas to wildlife (Chapter 2, Wildlife), livestock, and wild horses (Chapter 2, Vegetation).

The remaining riparian and wetland areas (1,045 acres), 13.7 miles of streams and one lake, would continue to be impacted by livestock congregation even though grazing systems would be established allowing periodic rest through specific grazing treatments (Perennial Streams and Threatened or Endangered Plants Map). This is not to say that grazing treatments are not beneficial to riparian vegetation as opposed to yearlong grazing. The rest that grazing treatments provide during the growing season would increase plant vigor resulting in a slow-down of riparian degradation and possible stabilization of some riparian areas. But, when livestock are allowed to graze they will continue to congregate in riparian areas and utilize most of the available forage rather than move into less desirable areas such as steep slopes and areas distant from water. Studies conducted by the Forest Service over a four year period on Malheur National Forest in Oregon state:

> ...determined through in-field examination that streamside management objectives cannot be achieved on streams used by livestock season-long. Much of the time, the deferred and deferred-rotation grazing systems were unable to achieve management objectives that have been identified for individual streams. The rest-rotation system was originally thought to be the answer for achieving streamside management objectives. However, the objectives for herbaceous vegetation were not being achieved within desired time limits (Storch 1979, p. 57).

As a result of this study, it can be concluded that even with periodic rest under a grazing system livestock would continue to impact riparian vegetation.

Apparent Range Trend

Expected changes in apparent range trend are tied in closely with changes in livestock forage condition. Apparent range trend would improve in most of the resource area because of allocation of vegetation to livestock, big game, and wild horses. Average utilization of key species would not exceed 50 percent and grazing systems with treatments designed to satisfy the physiological needs of the vegetation would be implemented. A significant long-term impact would result from implemention of the proposed action. There would be an increase in acres in the up category from 1,483,814 (41 percent) to 2,408,635 (67 percent); a 15 percent change was used to determine if the change would be significant. Table 3-5 shows the expected improvement in apparent range trend for the proposed action as compared with the current situation. Apparent range trend in wild horse use areas is expected to remain with no change because of continuous grazing. Appendix H, Section 3, Table H-7 shows expected changes by allotment.

Threatened or Endangered Plants

The majority of threatened or endangered (T/E) plants known to exist in the resource area are located along highway rights-of-way (Perennial Streams and Threatened or Endangered Plants Map). This alone points to the need for an in depth study on the distribution of threatened or endangered plants in the resource area. However, since most of the known populations of T/E plants occur in highway rights-of-way it is possible that these populations would be eradicated during construction and/or maintenance of the proposed fencing of the highway rights-of-way (Range Facilities and Land Treatments–Proposed Action and Alternatives Map). This would be a significant impact because the loss of a threatened or endangered plant would be in violation of the Threatened or Endangered Species Act.

Little information is known concerning impacts to T/E plants as a result of the proposed grazing management program, therefore no analysis can be made at this time. However, an informal consultation with Fish and Wildlife Service is scheduled for May 1980 and any conclusions reached will be added in the Final Environmental Impact Statement. Specific information requested concerning T/E Plants in the Tonopah Resource Area is found in Appendix L.

Conclusion

An improvement in livestock forage condition is the most significant long-term impact to vegetation as a result of the proposed action. Acres in good condition would go from 270,158 (seven percent) to 1,133,190 (31 percent), acres in fair condition would go from 1,118,887 (31 percent) to 1,534,848 (42 percent), and acres in poor condition would go from 2,096,808 (57 percent) to 817,815 (22 percent).

TABLE 3-5
CHANGES IN APPARENT RANGE TREND

Type of Action Time Period	Upward Acres	Upward Percent	No Apparent Trend Acres	No Apparent Trend Percent	Downward Acres	Downward Percent
Current—1979	1,483,814	41	2,071,137	57	61,476	2
Proposed Action—2015	2,408,635	67	1,207,792	33	0	0
No Action—2015	0	0	951,765	26	2,664,662	74
No Livestock Grazing—2015	2,478,152	69	1,138,275	31	0	0
Livestock Reduction/ Maximizing Wild Horses-- 2015	1,547,699	43	2,068,728	57	0	0

Source: Current taken from Table G-2, future taken from Appendix H, Tables H-7, H-8, H-9, and H-10.

A significant beneficial impact is the estimated increase in available AUMs. Future available AUMs would increase from 148,458 to 184,127, a change of 35,669 in the long-term due to several factors: 1) spray and seed projects on 16,405 acres would add an additional 3,033 AUMs; 2) burning and seeding on 18,800 acres would add 3,421 AUMs; 3) intensive management on 15 allotments with moderate stocking rates on all allotments in the resource area would add 14,271 AUMs; 4) water development in areas currently greater than four miles from water would add 14,122 AUMs; and 5) improvement in erosion conditon would add 822 AUMs.

Burning and spraying projects would convert 35,205 acres in the big sagebrush type to a grass dominated type. In riparian areas 955 acres would improve as a result of livestock exclusion. The remaining 1,045 acres of riparian vegetation would continue to receive grazing pressure from livestock, wild horses, and big game. However, grazing systems and reduced stocking rates should slow down degradation or stabilize the current condition.

UNAVOIDABLE ADVERSE IMPACTS

Degradation on 1,045 acres of riparian vegetation would continue even though it might be minimized as a result of grazing systems. Studies show that even under good grazing management riparian areas would at best be stabilized. This direct impact would continue as long as livestock and wild horses are allowed to graze riparian areas.

In order to obtain the desired increase in available vegetation and improvement in erosion condition class, a short-term disturbance of vegetation on 35,205 acres, as a result of vegetation manipulation projects, would be unavoidable.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Some short-term declines and long-term benefits in the vegetation resource are expected to result from the proposed action. Increased stocking rates per pasture, initial construction, and land treatments would result in increased pressure on or removal of existing vegetation in the short-term. After grazing systems have been in operation for several cycles and vegetation has regrown around management facilities and land treatments, vegetation diversity, quality, vigor, and density are expected to increase. Productivity is anticipated to increase in the long-term by 35,669 AUMs, or 24 percent of the vegetation resource.

NO ACTION ALTERNATIVE

IMPACTS

Livestock Forage Condition and Vegetation Production

The significant impact of the No Action alternative on vegetation would be a general deterioration in livestock forage condition; acres in good condition would decrease by 162,592 acres, fair condition would decrease by 524,783 acres, and poor condition would increase by 687,375 acres. This downward trend would result from: 1) existing use of vegetation by livestock, wild horses, and big game which is greater than available vegetation by 25,108 AUMs (Table 1-6)–the problem is especially acute in allotments containing wild horses because their populations are virtually uncontrolled,–and 2) continuance of yearlong grazing with no established periods-of-use. A summary of the change in livestock condition is shown in Table 3-4. See Appendix H, Section 1 for methodology in determining change in livestock forage condition.

Vegetation is being significantly–greater than 15 percent–overused in Crater Black Rock, Hot Creek, Hunts Canyon, Morey, Nyala, Reveille, and Stone Cabin allotments. A change of 15 percent or more was determined to be significant. Vegetation is being significantly–less than 15 percent–underused in Butterfield, Currant Ranch, Ione, Sand Springs, Smoky, and Wagon Johnnie allotments. The remaining allotments are being managed near carrying capacity (Table 1-6).

There are nine allotments which are currently being overused by 25,108 AUMs (Table 1-6). Six of the nine allotments would have significant impacts on vegetation as they contain excess numbers of wild horses. It is estimated that this significant overuse–greater than 15 percent–and yearlong use would cause a decrease in available production by 18,147 AUMs in the six allotments over the next 35 years (Table 1-6). This decrease in production would be reflected in livestock forage condition as a decrease in litter accumulation, loss of desirable forage plants and increased erosion. The decrease in livestock forage condition is attributed to excess grazing use, as well as to continued yearlong grazing. Cook and Stoddart (1964) showed there is "no question that stock need to leave the desert range as soon as growth of the shrubs is underway." This shows the seriousness of yearlong use on an already overutilized range, and points to severe degradation of the vegetative resource on these seven allotments.

Livestock forage condition on the six allotments which are currently being underused by 16,050 AUMs (Table 1-6) would be expected to improve over the 35 year period. However, continued yearlong grazing would tend to minimize any beneficial impacts. It is estimated that 12,603 additional AUMs would be produced in these six allotments by the year 2015 as a result of significant-greater than 15 percent-under utilization of the vegetative resource. Van Poollen and Lacey's (1979) study on herbage responses to stocking intensities on western ranges showed that a reduction in stocking rate from moderate to light produced a 28 percent increase in mean herbage production. Even though production would increase in these six allotments, livestock forage condition would not increase significantly as a result of continued yearlong use. See Appendix H, Section 1, Table H-2.

The remaining seven allotments which are currently being managed near carrying capacity would show no change in livestock forage condition as a result of yearlong grazing. Vegetation production would remain fairly constant (Table 1-6). AUMs lost from overuse and AUMs gained from underuse would result in a net loss of 5,544 AUMs by the year 2015.

Vegetation Types

Impacts on 155 acres of riparian vegetation in North and South Six-Mile Canyons and on 800 acres of wetlands in Railroad Valley would be the same as discussed under the proposed action in this section because they are currently excluded from grazing.

The remaining 1,045 acres of riparian vegetation would be significantly impacted as a result of continued yearlong grazing and overuse of the range. Davis (1977, p. 61) summarized the impacts from yearlong grazing of livestock on riparian communities in one paragraph:

> Overgrazing by domestic livestock, is probably the major factor contributing to the failure of riparian communities to propogate themselves. Continued overuse of riparian bottoms eliminates essentially all reproduction as soon as it becomes established. Overstocking and the consequent loss of vegetative cover on the adjacent watersheds is probably the main reason for the frequency of high intensity floods resulting in drastic changes in the density and composition of riparian bottoms.

Apparent Range Trend

Expected changes in apparent range trend for the No Action alternative are shown in Table 3-5. These changes would be caused by overutilization of key forage species and continuous grazing by livestock and wild horses. Appendix H, Section 3, Table H-8 shows expected changes by allotment.

Threatened or Endangered Plants

Of the 16 threatened or endangered plants none are known to be impacted at the current time. Very little information is available concerning T/E plants and no analysis can be made. An informal consultation with Fish and Wildlife Service is scheduled for May 1980, and any conclusions reached will be added in the Final Environmental Impact Statement.

Conclusion

A significant adverse impact is an overall decline in livestock forage condition (Table 3-4) as a result of overutilization of the vegetative resource and continued yearlong use. Acres in good condition would go from 270,158 (7 percent) to 107,566 (3 percent), acres in fair condition would go from 1,118,887 (31 percent) to 594,104 (16 percent), and acres in poor condition would go from 2,096,808 (57 percent) to 2,784,183 (76 percent). A decrease in vegetation production would result in a net loss of 5,544 AUMs of available vegetation in the year 2015 (Table 1-6).

A total of 955 acres of riparian vegetation would improve in the North and South Six-Mile Canyons and wetlands in Railroad Valley as a result of livestock exclusion. The remaining 1,045 acres of riparian vegetation would decline in condition because of the continued heavy grazing pressure from livestock, wild horses, and big game.

UNAVOIDABLE ADVERSE IMPACTS

Degradation on 1,045 acres of riparian and wetland vegetation would continue as a result of yearlong grazing. Degradation would occur especially in those allotments which are currently being overused by livestock and wild horses.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Short-term overuse by 25,108 AUMs in nine allotments and short-term underuse by 16,050 AUMs

in six allotments would cause a decrease in available vegetation from 148,458 AUMs in 1979 to 142,914 AUMs in the year 2015 (Table 1-6). This shows a net loss of 5,544 AUMs in available vegetation by the year 2015.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Livestock Forage Condition

The most significant impact of this alternative on vegetation would be the marked increase in livestock forage condition as a result of the removal of all domestic livestock from BLM-administered public land; acres in good condition would increase by 896,558 acres, fair condition would increase by 412,676 acres, and poor condition would decrease by 1,309,234 acres. This means 71 percent of the grazing land in the resource area would improve at least one condition class. This improvement far exceeds the 15 percent needed to be a significant impact. The expected changes in Livestock Forage Condition for the No Livestock Grazing alternative are almost identical to the proposed action (Table 3-4). A summary of the change in livestock forage condition over a 35 year period for each kind of livestock is shown in Table 3-4. See Appendix H, Section 1 for methodology in determining change in livestock forage condition.

Vegetation which is currently being grazed by livestock would be allowed to complete growth cycles without grazing pressure from livestock. Plants which have been grazed in the past would increase in vigor soon after the livestock were removed because "usually one or two years rest is adequate to restore plant vigor" (Hormay 1970, p. 16). The vegetation would then begin to move toward climax because "partial or complete protection from grazing on deteriorated rangeland releases the vegetation from disclimax status, and secondary succession follows" (Tueller 1973, p. 59). This would be true in most types; an exception might be types such as a big sagebrush type with no understory which would probably remain at a subclimax until a fire or other catalyst changed the seral state of the type.

The above is true for much of the resource area except areas occupied by wild horses. These areas, although less degraded because of the removal of livestock, would still experience the same impacts as discussed in the proposed action section of this chapter. Areas occupied by big game would show many of the same beneficial impacts discussed above, and would move toward a state of climax similar to what was present before the introduction of domestic livestock. See Appendix H, Section 1, Table H-3.

Vegetation Production

It is estimated that production outside wild horse use areas would increase 25 percent (37,118 AUMs) as a result of most types improving one condition class in 35 years; this improvement is based on professional judgement and supporting research. Studies done in salt desert shrub types in Pine Valley, Nevada, by Holmgren and Hutchings (1972) show that usable forage increased from 70 pounds per acre to 115 pounds per acre (60 percent) after 26 years of no grazing. From this study it would seem that a 25 percent overall increase in the long-term as a result of livestock exclusion would be conservative. Nevertheless, this represents a significant increase in vegetative production because the increase would be greater than 15 percent. In wild horse areas it is estimated that although there may be some improvement due to removal of livestock there would not be a significant increase in forage production.

Vegetation Types

All riparian and wetland areas (1,685 acres) would improve significantly with the removal of livestock except those riparian areas (315 acres) which are within wild horse use areas. This improvement in riparian and wetland areas would be significant because 84 percent of the total riparian and wetland areas would improve. A study done at Mahogany Creek in Northern Nevada showed that "only after complete removal of livestock use by fencing was significant riparian habitat improvement accomplished" (Dahlem 1979, p. 34). In just two years of livestock rest, vegetative cover improved 9 percent and bank stability improved 20 percent. The study also showed that "reduction in livestock grazing, but continued use, had little beneficial effect on riparian habitat along Mahogany Creek" (Dahlem 1979, p. 34). This situation would be similar to what would be found in wild horse use areas. Although livestock would be removed from wild horse use areas, there would be continued yearlong use of the vegetation by wild horses. This continued yearlong use would not allow the resource to significantly improve.

Apparent Range Trend

Expected changes in apparent range trend for the No Livestock Grazing alternative are summarized in Table 3-5. These changes would be caused by elimination of livestock grazing on the resource area and by continuous grazing of wild horses in wild horse use areas. Appendix H, Section 3, Table H-9 shows changes by allotment.

Threatened or Endangered Plants

Of the 16 threatened or endangered plants none are known to be impacted as a result of removal of all livestock. However, little information is available concerning T/E plants and no analysis can be made at this time. An informal consultation with Fish and Wildlife Service is scheduled for May 1980 and any conclusions reached will be added in the Final Environmental Impact Statement.

Conclusion

Livestock forage condition would improve significantly under this alternative as a result of complete livestock removal. Acres in good condition would go from 270,158 (seven percent) to 1,166,716 (32 percent), acres in fair condition would go from 1,118,887 (31 percent) to 1,531,563 (42 percent), and acres in poor condition would go from 2,096,808 (57 percent) to 787,574 (21 percent).

Improvement in vegetative production would provide an additional 37,118 AUMs (148,458 AUMs to 185,576 AUMs) in 35 years in areas with no livestock or wild horses. Wild horse use areas would remain the same.

All riparian and wetland areas (1,685 acres) would improve significantly with the removal of livestock except those riparian areas (315 acres) which are within wild horse use areas.

UNAVOIDABLE ADVERSE IMPACTS

Significant unavoidable impacts to 315 acres of riparian vegetation in wild horse use areas would continue under this alternative. These areas would be held in a degraded state as long as wild horses are allowed to stay in them yearlong.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

Livestock Forage Condition

The most significant impact under this alternative would be the improvement in livestock forage condition; acres in good condition would increase by 752,630 acres, acres in fair condition would increase by 116,978 acres, and acres in poor condition would decrease by 869,608 acres. This represents an improvement in livestock forage condition of at least one condition class on 45 percent of the resource area. A summary of the change is shown in Table 3-4. See Appendix H, Section 1 for methodology in determining change in livestock forage condition.

The rationale for these changes in livestock forage condition are the same as for the proposed action section of this chapter.

Seven allotments (Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky) would have less than a 40 percent reduction in livestock grazing and would have intensive grazing management. Livestock forage condition would improve one condition class in areas of the allotments where apparent trend is upward or static and would remain the same in areas with a downward trend. Five allotments (Forest Moon, Hunts Canyon, Reveille, Stone Cabin, and Wagon Johnnie) would be totally covered by big game or wild horse use areas. These allotments would not have livestock grazing. A direct impact would be a 25 percent increase in available vegetation for wildlife use areas in 35 years based on improvement through management (Table 1-10). Allocations to wildlife would increase from 14,826 AUMs to 17,117 AUMs. Intially 23,748 AUMs would be allocated to wild horses with a future projection of 48,166 AUMs (Table 1-10). Range trend would remain static in wild horse use areas due to allocation of all available vegetation and yearlong grazing. Livestock forage condition would remain the same.

Eight allotments (Butterfield, Crater Black Rock, Currant Ranch, Hot Creek, Morey, Nyala, Ralston, and Willow Creek) would receive a significant reduction (more than 40 percent) in livestock grazing. They would have less intensive management. In areas of the allotments where livestock forage condition has an upward apparent trend, vegetation would improve one condition class. Areas with static or downward apparent trend would remain the same. These changes in livestock forage condi-

tion are shown by allotment in Appendix H, Section 1, Table H-4.

Vegetation Production

It is estimated that through management in the seven allotments designated for AMPs, development of livestock support facilities and the reduction in livestock would increase available vegetation from 148,458 AUMs currently to 183,022 AUMs in 2015 (23 percent increase). Support for these changes are the same as those discussed under the proposed action subheading of this section. Vegetative production lost from the long-term disturbance of 55 acres as a result of the construction of livestock support facilities would be insignificant when compared to the entire resource area. Therefore, impacts from livestock support facilities will not be discussed here but are shown by allotment in Appendix H, Section 2, Table H-6.

Spray and seed projects are proposed on 3,880 acres in the Monitor allotment (Range Facilities and Land Treatments–Proposed Action and Alternatives Map). The significant impact to vegetation as a result of these projects would be a reduction or loss of overstory vegetation transforming the site from a dominant shrub type to a dominant grass type. This would result in a long-term decrease in soil erosion (Chapter 3, Soils). It is estimated that 719 additional AUMs of available vegetation would result from the reseeding projects.

Vegetative Types

As stated in this section's proposed action, 955 acres of riparian and wetland vegetation would improve as a result of livestock exclusion. In seven allotments riparian and wetland areas would continue to be directly impacted by livestock even though periods-of-use would be established through grazing treatments (Storch 1979). In the five allotments with no livestock grazing, riparian areas in wild horse use areas would continue to be directly impacted because of yearlong grazing. However, riparian areas within these five allotments which are not within wild horse use areas would improve significantly. The remaining 1,045 acres of riparian and wetland areas in the remaining eight allotments would continue to be directly impacted.

Apparent Range Trend

Expected changes in Apparent Range Trend for the Livestock Reduction/Maximizing Wild Horses alternative are shown in Table 3-5. These changes are due to intensive management on seven allotments, less intensive management on eight allotments and livestock elimination on five allotments. Appendix H, Section 3, Table H-10 shows changes by allotment.

Threatened or Endangered Plants

Impacts on threatened or endangered plants as a result of construction or maintenance of the proposed livestock support facilities in Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky allotments would be the same as those discussed under the proposed action subheading in this section. Of the 16 threatened or endangered plants none are known to be impacted as a result of a significant reduction in livestock grazing. Little information is available concerning T/E plants and no analysis can be made at this time. An informal consultation with Fish and Wildlife Service is scheduled for May 1980 and any conclusions reached will be added in the Final Environmental Impact Statement.

Conclusion

Livestock forage condition would improve significantly under this alternative because of intensive management in seven allotments mentioned above and to a lesser degree from the eight allotments mentioned above with less intensive management. Acres in good condition would go from 270,158 (seven percent) to 1,022,788 (28 percent), acres in fair condition would go from 1,118,887 (31 percent) to 1,235,865 (34 percent), and poor condition would go from 2,096,808 (57 percent) to 1,227,200 (33 percent).

Spray and seed projects on 3,880 acres in Monitor allotment would increase vegetative production on these acres and provide an additional 719 AUMs of available vegetation. Total available vegetation would increase from 148,458 currently to 183,022 in 35 years.

Riparian and wetland vegetation would improve significantly on 955 acres as a result of livestock exclusion. The 1,045 acres of riparian or wetland areas in areas with livestock or wild horses would continue to be overutilized.

UNAVOIDABLE ADVERSE IMPACTS

Degradation of 1,045 acres of riparian and wetland vegetation would continue even though it might be minimized on a portion of the resource area with intensive management as a result of grazing treatments and periods-of-use. This impact

would continue as long as livestock and wild horses are allowed to graze riparian areas.

In order to obtain the desired increase in available vegetation and improvement in erosion condition class, a short-term disturbance of vegetation (3,880 acres) as a result of a vegetation manipulation projects would be unavoidable.

WILDLIFE

PROPOSED ACTION

IMPACTS

The primary wildlife species to be impacted by the proposed action would be big game. The proposed action has both short-term and long-term effects on wildlife. Short-term effects to big game would result from vegetation allocation and proposed periods-of-use. Long-term effects would result from vegetation allocation, grazing treatments, range improvement projects, and land treatments. The impacts of these short-term and long-term effects would be changes in population numbers. Significant impacts to these species are defined as, "an impact resulting in any increase or decrease in big game population numbers."

The overall impact of the proposed action would be an increase in population numbers. Allocation of vegetation to meet big game needs, cyclic livestock grazing treatments, range improvement projects, etc. as identified in the proposed action would reduce existing competition among livestock, wild horses, and big game and result in an overall increase of forage quality and quantity. Site-specific effects on individual big game species resulting from particular periods-of-use, grazing treatments, etc. could be either positive (+), static (o), or negative (-) depending on vegetation condition, trend, etc. However it is the cumulative effect of these site specific flucuations that result in the overall impact. These effects are analyzed further in Table 3-6.

Other species to be impacted by the proposed action would be those dependent, all or during part of their life cycle, on the limited habitat of riparian and meadow communities. Heavy use of meadow and riparian vegetation surrounding water sources, springs, seeps, and streams caused by the concentration of livestock would continue under the proposed action. The periodic rest followed by concentrated use would not improve the existing condition of these crucial wildlife areas, as indicated by Hormay (1976, p. 2), when he states, "Vegetation in certain areas, such as meadows and drainage ways are invariably closely utilized under any stocking rate or system of grazing. Such use would be detrimental to wildlife and esthetic or recreational values."

Significant impacts to these other wildlife species are defined as, any impact that would result in either deterioration or improvement of the already limited, critical habitat provided by riparian and meadow communities.

Mule Deer

Since the late 1960s (when mule deer populations were at an all time low), Central Nevada deer herds have slowly increased. Current populations are approximately 8,000 in the resources area. Habitat conditions, however, are in a generally static or declining condition and trend. In general, winter ranges have low browse reproduction and summer ranges offer low quality forbs and grasses.

As Table 3-6 indicates, the vegetation allocation would allow for an overall increase in deer numbers. Recognition of these foraging ungulates through the allocation procedure and the adjustments of livestock stocking rate would result in a decrease in competition for forage between livestock and mule deer. Decreases in stocking rates of livestock would result in increased vegetation production (Van Poollen and Lacey 1979). Increased vegetation production would result in increased deer populations (Plummer et al. 1968).

Site-specific effects would result in continued competition between livestock and mule deer for forage during some periods-of-use and some grazing treatments due to overlapping key use areas, diet preferences, and behavior patterns. The impact of these effects is achieving less than the desired increase in deer numbers (Appendix A, Sec. 3, Table A-4).

For example, grasses in early spring are required for mule deer growth in body size and weight, antler development, fawning, and nursing. Their needs for succulent high protein foods are reflected in their use of green grass and forbs during the critical spring season (Smith 1976). Livestock require a high percentage of grasses in spring also (Conner et al. 1963). This overlapping forage requirement coupled with the limited number of riparian and meadow areas will continue to result in concentrated use of these areas and competition between mule deer and livestock.

Competition between mule deer and livestock for browse species could also be expected despite

TABLE 3-6
IMPACTS TO BIG GAME FROM IMPLEMENTATION OF THE PROPOSED ACTION
(In Numbers of Animals)

Allotment	Species	Effect a/ of Period-of-Use	Change b/ in Numbers Short-Term	Effects a/ of Grazing Treatment 1 2 3 4 5 d/	Effects a/ of Livestock Support Facilities 1 2 3 4 5 6 e/	Effects a/ of Treatments Burn	Spray	Change c/ in Numbers Long-term 2015	Comments
Blue Eagle	Antelope	+	0-10	* * * * *	- * * * *	*	*	0-10	Antelope yearlong
	Bighorn Sheep	-	0	* * * * *	+ * * * *	*	*	0-10	Fall through spring use by bighorn sheep is critical here
Butterfield	Mule Deer	-	(-)30-(-)40	* * * * *	o * o o o	*	*	0-10	Most deer use is for winter range
	Antelope	+	0-10	* * * * *	- * + + +	*	*	0-10	Antelope yearlong
	Bighorn Sheep	+	40-50	* * * * *	+ * + o o	*	*	50-60	The area is used by bighorn sheep yearlong
Crater Black Rock	Mule Deer	o	30-40	* * * * *	- + * * +	*	*	30-40	Deer winter use
	Antelope	o	0-10	* * * * *	- + * * +	*	*	0-10	Antelope yearlong
Currant Ranch	Mule Deer	-	0	* * * * *	* * * * *	*	*	0-10	Deer winter use
	Bighorn Sheep	o	0-10	* * * * *	* * * * *	*	*	10-20	Bighorn sheep use is yearlong
Forest Moon	Mule Deer	-	0-10	* * * * *	* * * * *	*	*	0-10	Deer winter and summer use
	Bighorn Sheep	o	0-10	* * * * *	* * * * *	*	*	0-10	Bighorn sheep yearlong
Hot Creek	Mule Deer	-	240-250	o o + - -	- o o	*	*	600-610	Competition for browse despite allocation
Hunts Canyon	Antelope	+	0-10	o + + o +	- + + +	*	*	10-20	Antelope yearlong
Ione	Mule Deer	o	60-70	o + + - o	- o + o o	+	*	60-70	Deer summer and winter use
Monitor	Mule Deer	-	10-20	o o + - o	- o o o	*	o	20-30	Deer winter
	Antelope	o	0-10	o + + o +	- + + +	*	+	0-10	Antelope yearlong
Morey	Mule Deer	-	(-)540-(-)550	o o + - -	- o o o	*	*	(-)400-(-)410	Key deer winter range and summer range, competition for browse is high
Nyala	Mule Deer	-	30-40	o o + - -	- o o o o	*	*	30-40	Deer winter
	Antelope	o	10-20	o + + - -	- + + + o	*	*	10-20	Antelope yearlong
	Bighorn Sheep	o	10-20	o + + - o	+ o o o o	*	*	10-20	Bighorn sheep use is primarily during winter
Ralston	Mule Deer	o	30-40	o o + - o	- o o o *	*	*	30-40	Deer winter
	Antelope	+	30-40	o + + o +	- + + + *	*	*	30-40	Antelope yearlong
Reveille	Mule Deer	+	370-380	o + + - o	- o o o *	*	*	270-280	Contain key deer summer range and some deer winter
	Antelope	+	80-90	o + + o +	- + + + *	*	*	80-90	Antelope yearlong
San Antone	Mule Deer	o	390-400	o o + - o	- + o o *	*	*	390-400	Deer winter--water is currently limiting
Sand Springs	Mule Deer	-	110-120	o o + - o	- + o o *	*	o	130-140	Deer winter use water is limiting
	Antelope	o	0-10	o + + o o	- + + + *	*	+	0-10	Antelope yearlong
Smoky	Mule Deer	-	(-)440-(-)450	- - + - -	- * o o o	*	*	(-)390-(-)400	Deer winter concentration result in competition for browse
	Antelope	o	0-10	o + + - +	- * + + +	*	*	0-10	Antelope yearlong

TABLE 3-6 (Continued)
IMPACTS TO BIG GAME FROM IMPLEMENTATION OF THE PROPOSED ACTION
(In Numbers of Animals)

Allotment	Species	Effect a/ of Period-of-Use	Change b/ in Numbers Short-Term	Effects a/ of Grazing Treatment 1 2 3 4 5 d/	Effects a/ of Livestock Support Facilities 1 2 3 4 5 6 e/	Effects a/ of Treatments Burn	Spray	Change c/ in Numbers Long-term 2015	Comments
Stone Cabin	Mule Deer	-	110-120	o o + - o	o + + o o	+	o	370-380	Deer winter and summer use
	Antelope	+	90-100	o + + o o	- + + o +	+	+	90-100	Antelope yearlong
Wagon Johnnie	Mule Deer	o	640-650	* * * * *	* * * * *	*	*	640-650	Deer winter and summer
	Antelope	+	70-80	* * * * *	* * * * *	*	*	70-80	Antelope yearlong
Willow Creek	Mule Deer	o	40-50	* * * * *	* * * * *	*	*	40-50	Deer winter and fall
	Antelope	+	0-10	* * * * *	* * * * *	*	*	0-10	Antelope yearlong
TOTALS	Mule deer		1,100-1,110					1,980-190	
	Antelope		340-350					350-360	
	Bighorn sheep		70-80					90-100	

a/ Impacts resulting from proposed periods-of-use, grazing treatments and livestock support facilities as represented by the following symbols.
+ = positive impact
- = negative impact
o = no significant impact

These pluses and minuses interact to result in changes in numbers in the short- and long-term. In determination of "significance" an increase or decrease in numbers, resulting from vegetation allocation, periods-of-use, or range improvements, is significant.

b/ "Change in Numbers" refers to the change in numbers of animals from existing populations to expected population for which allocations have been made (all figures are positive unless a negative sign appears). These changes in the short-term would be a result of vegetative allocation and periods-of-use.

c/ Change in numbers refer to the change in numbers of animals from existing populations to expected populations for which allocations have been made. These changes in the long-term (2015) would be a cumulative result from the vegetation allocation, grazing treatments, projects and vegetation treatments.

d/ The following codes denote the grazing treatments as identified in the proposed action:
1= rest late winter to late spring
2= rest late winter to late summer
3= rest 10 months spring to late summer
4= graze early fall to early winter
5= rest 2 months in spring

e/ The following codes denote the proposed livestock support facilities as identified in the proposed action:

1= Fences
2= Wells
3= Springs
4= Troughs
5= Pipelines
6= Storage Tanks

Note: Refers to Tonopah Resource Area.

* Indicates that treatments and/or projects are not applicable on these allotments.

Source: Environmental impact data was compiled from proposed action tables for vegetation allocation and reasonable numbers as jointly determined by BLM and Nevada Department of Wildlife. Compiled September, 1979.

allocations. Grazing of livestock in late summer through winter (Treatments 2 and 4) in mule deer winter ranges would result in competition for quality browse. This is due to livestock preferring bitterbrush and other palatable browse species at this time of the year (Conner et al. 1963) and their arrival on the ranges prior to wintering mule deer.

Studies have demonstrated the inate ability of grazing animals to select the more nutritious forage (Cook and Stoddart 1964). Thus, while vegetation has been allocated to allow for mule deer expansion, the seasonal competitive livestock use would result in competition for quality browse in fall-winter months and for grasses and forbs in spring-summer months.

A major portion of deer use on the resource area occurs during the winter. The majority of the proposed periods-of-use (Table 1-1) are during summer and winter months, allowing for rest during the spring. Table 3-6 summarizes impacts of the proposed periods-of-use by allotment. Inspection of Table 3-6 reveals either a negative impact or no impact of the proposed periods-of-use for the allotments containing deer winter range. This is because livestock grazing of browse plants prior to deer use in the winter could result in poor browse reproduction and low availability of palatable twigs and branches (Giunta et al. 1978). Positive results can be expected from the proposed periods-of-use on the Kawich Range (Reveille allotment) because it is key summer range and rest during the growing season would leave important forbs and grasses for deer.

Table 3-6 indicates that the proposed action would allocate vegetation for approximately 540-550 less mule deer than are currently using the Morey allotment. Studies (Tueller and Monroe 1975) indicate that the browse in the key winter range is in a declining condition. Bitterbrush plants tend to be decadent here due to competition from encroaching pinyon and juniper trees, and little forage is produced. The winter range condition is not expected to change significantly unless land treatments to improve wildlife habitat are imposed or fencing to exclude livestock is constructed.

The top of the Kawich range, located in both Reveille and Stone Cabin allotments, would benefit from the proposed periods-of-use. The rest provided during spring and summer months would improve forage condition on this key summer range for deer. The absence of livestock should decrease competition for this important vegetation.

The impacts of the proposed grazing treatments are analyzed in Table 3-6. Key mule deer summer habitat and summer ranges would benefit from Treatments 1,2, and 5. These treatments would allow seedling establishment of forbs and grasses and remove competition among deer, livestock, and/or horses during this critical use period. Impacts to be expected from this are: 1) increased fawn production 2) improved fawn survival and 3) healthier deer herds going into winter ranges resulting in overall population increases.

Treatment 4 on allotments with winter ranges would result in negative effects because of livestock grazing removing the more palatable and nutritious browse prior to the arrival of wintering deer.

Mule deer would be forced to range over a greater area to obtain available forage in these circumstances, and in some areas populations might not reach reasonable numbers.

Treatment 3 would significantly benefit allotments with winter ranges because it would allow browse seedlings to establish and improve browse reproduction. The expected impacts resulting from the treatment would be: 1) increased herd winter survival; 2) improved fawn production; and 3) increased herd populations.

The 807 miles of proposed fences could have an affect on mule deer populations as they migrate between summer and winter ranges. Although fences would be constructed to wildlife standards, a certain amount of injury and death could occur when deer are cut by barbed wire or become entangled in fences. However, fences would have a long-term positive impact on deer ranges by improving livestock distribution for management purposes. The areas rested yearlong would be accessible only to wildlife providing areas of non-competitive forage of improved quality.

The development of 118 miles of pipeline, 76 water troughs, 19 wells and 20 springs would increase water availability throughout the resource area for wildlife as well as livestock resulting in an expected overall benefit to wildlife.

No significant impact on mule deer is expected from the proposed land treatments.

There is a significant deficit in mule deer forage in three allotments which will result in a significant decrease in mule deer numbers from existing populations.

The cumulative impact of treatments, range improvement projects, etc. as identified by the proposed action would result in a significant beneficial increase (from existing populations) of approximately 1,100-1,110 mule deer in the short-term and 1,980-1,990 mule deer in the long-term for the resource area.

Antelope

Antelope occur in small bands throughout the resource area and populations (approximately 560) appear to be static. Antelope habitat is in poor to fair condition. The allocation of vegetation for antelope and recognition of forage needs would result in increased herbage production and improved habitat for antelope (Barrett 1978). Proposed periods-of-use resulting in rest during at least two months in the spring would generally improve forage for antelope. It should help reduce competition for early green-up grasses and forbs, which are highly sought after by antelope, livestock, and wild horses.

The proposed grazing treatments, particularly Treatments 1, 2, 3, and 5, would generally have either no affect or might improve habitat condition for antelope.

Antelope require a high percentage of browse in their diet from late summer through the winter (USDI, BLM, Ely District, 1975-1976). Therefore, grazing Treatment 4 in antelope wintering areas could result in some site specific competition between livestock and antelope.

The proposed fences, although constructed to antelope standards, could still result in some injury and death due to cuts from barbed wire and entanglement in fences. Fences would, however, have a long-term positive impact on antelope by improving livestock distribution for management purposes. The areas rested yearlong would be accessible only to wildlife providing areas of non-competitive forage of improved quality.

Proposed water developments would increase water availability throughout the resource area. This would assist in fulfilling antelope daily water requirements and result in expansion of suitable available habitat.

The proposed land treatments would have either no impact or a beneficial impact on antelope. The proposed burning and seeding projects should prove beneficial to antelope. They would increase the variety of forbs, grasses, and browse and aid in providing the subclimax vegetative condition on which antelope thrive (Yoakum 1978). This would improve kid survival and the general health of the herd.

With vegetation allocation, seasonal treatments, increased water distribution, burning, and general vegetation improvement, it is expected that over-all antelope habitat would improve with the following effects: 1) increased carrying capacity and health of adult animals and 2) improved productivity of the herds. This would result in a significant beneficial increase of 340-350 antelope in the short-term and 350-360 antelope in the long-term for the resource area.

Bighorn Sheep

A band of approximately 110-120 bighorn sheep occur at the north end of the Grant Range and some of these sheep winter on lands in the resource area. The Nevada Department of Wildlife feels the most critical time for this sheep population is during the winter months (McQuivey 1978). This is a result of their concentration on limited habitat areas due to the snow.

Bighorn winter forage requirements include a significant percentage of browse which overlaps livestock winter diet requirements. Grazing in bighorn sheep wintering areas from late summer to late fall (Treatment 4) would result in competition for forage between bighorn sheep and livestock. Late summer grazing (Treatment 2) would reduce the forage available to bighorn sheep during the winter.

While some site specific competition would be anticipated when these two treatments are applied, the overall impact of vegetation allocation and cyclic exclusion of livestock would result in increased herbage production on both winter and summer ranges (Van Poollen and Lacey 1979). This increase in available forage would result in a significant beneficial increase of 70-80 bighorn sheep in the short-term and 90-100 bighorn sheep in the long-term.

Elk

Fifty Rocky Mountain elk were introduced to the Monitor Range (managed by the Toiyabe National Forest) in January 1979.

The proposed allocation allows for a significant beneficial increase of 100 elk on BLM-administered public lands in Little Fish Lake Valley. It is currently unknown as to whether elk use would even occur here or how many would use the area. Assuming the herd does use this area it would be some time before population levels reach 100.

Should populations exceed 100 on BLM-administered public lands, competition could be significant due to diet similarities among horses, cattle, and elk.

Sage Grouse

Sage grouse occupy much of the sagebrush habitat within the resource area. The often widely

scattered flocks are found primarily along water courses, wet meadows, and in areas of dense sagebrush stands.

The effects of livestock grazing on sage grouse habitat are primarily of three types: 1) changes in vegetation composition, density, and structure; 2) disturbance of nesting hens and possible nest trampling; and 3) removal of brood cover in meadows (Call 1974).

The wet meadows and stream bottom riparian areas preferred by sage grouse for brooding areas (Wallestad 1975) are also preferred by livestock. Implementation of the proposed periods-of-use would allow livestock use on these key areas during critical periods for sage grouse. Establishment of the cyclic grazing treatments would concentrate use on some areas and might perpetuate the current unstable condition of many of these areas (Chapter 3, Vegetation section).

The proposed conversion of 35,205 acres of big sagebrush through the use of herbicides, burning, and seeding could impact sage grouse populations. The proposed land treatments are not expected to effect known sage grouse strutting grounds directly in the resource area. Sagebrush control may not have an immediately noticeable effect on a sage grouse population, depending upon the size of the area treated in relation to the total habitat available. In Idaho, Klebenow (1970) noted the cessation of nesting on newly sprayed areas with less than five percent live sagebrush canopy cover and observed that nesting was nearly non-existent in older sprayed areas with around five percent live sagebrush cover. Broods were less affected by herbicide treatment and continued to use some sprayed areas. Some sagebrush control may be desirable when the range has degraded to the point where it is unsuitable because of high shrub density crowding out food plants.

The long-term effect of the land treatments could be beneficial for sage grouse brooding areas by providing additional forbs. Long-term effects of the vegetation allocation and grazing treatments would increase herbage production (Van Poollen and Lacey 1979). Riparian and meadow areas, however, would not improve under the proposed action (Chapter 3, Vegetation section). Due to the dependence of sage grouse on these vegetative communities, no change in population would be expected as a result of the proposed action.

Waterfowl

Railroad Valley Wildlife Management Area, managed by NDW and BLM, provides the only significant waterfowl production in the resource area. These lands have been withdrawn from livestock grazing in order to manage the area primarily for wildlife, especially for the production of waterfowl. This will result in significant increases in waterfowl production.

The grazing proposed for the Railroad Valley Wildlife Habitat Management Area (WHMA) is designed to periodically remove old growth and stimulate new growth. The technique would be used to improve nesting cover.

Other Animals

In arid climates key habitat areas such as meadows, water sources, and riparian areas fulfill significant needs for many wildlife species as well as for livestock and wild horses. These biotic communities have an importance to wildlife greatly disproportionate to their limited acreage (Brown et al. 1977).

Proposed periods-of-use and grazing Treatment 3 would allow these communities rest during the critical growing season. Although the other grazing Treatments (1, 2, 4, and 5) offer cyclic rest and propose to allocate vegetation to the proper stocking level, they would still result in continued concentrated use of riparian communities by livestock, horses, and wildlife. This is supported by R.J. Behnke and R.F. Raleigh (1978), who stated "It seems obvious to us that if the new BLM grazing proposals rely primarily on rest-rotation grazing systems, a continued downward trend will occur in the riparian vegetation with further reduction in fishery and wildlife habitat values." The proposed action would, therefore, result in a reduction in species diversity of those animals dependent on riparian communities.

Aquatic Species

The primary aquatic species to be impacted by the proposed action would be brook trout, brown trout, rainbow trout, and cutthroat trout. There are currently 20.7 miles of perennial streams on BLM-administered lands in the resource area of which 3.7 miles are in excellent condition, .5 miles in good condition, 13.5 miles in fair condition, and 3 miles in poor condition (USDI, BLM, Tonopah Stream Surveys, 1976-1978).

The impact of livestock grazing on aquatic life and associated habitat is dependent on the number of grazing animals per unit of area and the period and duration of use. The lack of water and sparse vegetation on much of the resource area causes livestock to concentrate on the riparian habitat for water, shade, and forage. When the grazing season extends more than two to three months (Waldrip

and Malespin 1979) the impact on riparian vegetation is out of proportion with the rest of the pasture.

Fish habitat would be affected the most adversely when the greatest livestock use occurs and would benefit from periods of rest. Streamside vegetation would be removed by grazing resulting in higher summer water temperatures and decreased cover (Behnke and Raleigh 1978). Smaller populations of fish would result.

Sedimentation of streambeds would continue from upland areas as described under Water Resources in Chapter 2. Erosion of streambanks and livestock walking in streams cause unstable stream channels and further sedimentation. Increased sedimentation adversely affects production of trout by lowering survival of eggs and young fish, limiting aquatic food organisms, and reducing rearing habitat (Armour 1979).

Livestock walking in the stream could also destroy developing trout eggs in gravel beds (Armour 1979). Fall grazing treatments would cause more of this type of mortality because most of the existing trout population, Eastern Brook and German Browns, are fall spawners.

In applying these principles to the existing situation in the resource area it is expected that implementation of the proposed action would bring the following results: 3.7 miles of stream continuing in excellent to good condition, 2 miles of streams in fair condition, and an increase of stream miles in poor condition from 3 miles to 8 miles. Seven miles of stream (South Six Mile Creek) currently in fair condition with a downward trend, would be expected to improve significantly to a good condition due to the exclusion of livestock grazing. This projection of habitat condition is based on professional judgement and the following statement from Carl Armour (1979, p. 39):

> There is controversy associated with rest-rotation because there are professionals who categorically question suitability of the system for materially improving fish habitat, particularly for badly degraded sites in arid locations. Part of the negativism is attributed to observations that during use periods livestock continue to congregate along streams where they severely utilize vegetation and trample banks prior to grazing areas farther away from water. Stream banks thusly are impacted each year grazing occurs and recovery is impeded.

The overall impact of the proposed action to the resource area fisheries would be fewer fish per mile and general reduction in fish size in all streams in the resource area except South Six-Mile because South Six-Mile would be excluded from livestock grazing.

Conclusion

Overall the impacts of the proposed action are considered to be significant and beneficial to big game. Implementation of the proposed action would result in an approximate increase of 1,100-1,110 mule deer in the short-term and 1,980-1,990 mule deer in the long-term, 340-350 antelope in the short-term and 350-360 antelope in the long-term, 70-80 bighorn sheep in the short-term and 90-100 bighorn sheep in the long-term.

Vegetation allocations, cyclic exculsion of livestock grazing, increased water availability, and increased forb and grass diversity in land treatment areas would result in general improvement of forage quality and habitat condition for wildlife, except in riparian and meadow areas. In riparian areas where current condition and trend is good, conditions would probably remain static. Riparian communities in poor condition would continue to decline, possibly at a slower rate than is currently occurring. This would result in static sage grouse populations and decreased fish populations in all streams in the resource area except South Six-Mile. Decreased quality in riparian communities would also result in reduction of species diversity of those animals dependent on them.

UNAVOIDABLE ADVERSE IMPACTS

Overgrazing of key riparian, meadow, and wet areas would result regardless of which grazing system is initiated. Cyclic exclusion of livestock and long periods of rest (Treatment 3, 16 months rest) should prevent extreme deterioration. The impact of this effect would be static populations of sage grouse and decreased fish populations.

Due to a deficit in mule deer forage in three allotments, an unavoidable adverse impact of a significant decrease in mule deer numbers from the existing population is anticipated.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

On the proposed land treatment projects, short-term productivity would be lost after burning or spraying is accomplished. However, in the long-term, the treatments would benefit antelope and sage grouse.

NO ACTION ALTERNATIVE

IMPACTS

Under the No Action alternative, wildlife populations could be expected to stay the same as existing numbers in some areas and improve or decline in others.

Mule deer populations are currently on an upward trend due to improved forage conditions probably resulting from good precipitation in recent years. However, long-term habitat trend is still downward because of pinyon-juniper encroachment on winter browse areas and competition for use on key meadows, seeps, and riparian areas. Under current management, or the No Action alternative, deer populations would not be expected to increase.

Pronghorn antelope populations would probably remain static or decline slightly under the No Action alternative due to current range condition and existing water developments (Jim Lusk, NDW, personal communication, 1979). Bighorn sheep numbers would probably remain the same or decline due to limited availability of winter forage. A No Action alternative would give the Bureau less control over vegetation allocation for elk.

Declines in sage grouse population resulting from continued heavy use of meadows and stream margins critical for brooding and rearing areas would probably occur (Ron Lee, NDW, personal communication, 1979).

Riparian and aquatic habitat conditions could be expected to continually decline. Probably less than 2 miles of stream in the resource area would remain in fair, good, or excellent condition, leaving up to 18.7 miles in poor condition.

Livestock concentrations on riparian and meadow areas would continue and significant improvement of cover, bank stabilization, and sedimentation seems unlikely.

Fish populations would decline in all streams except Danville and Moores Creek because of reduced cover, poorer survival of eggs and fry, and a reduction in food organisms in streams (Armour 1979).

For a summary of impacts, see Table 3-9.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Elimination of grazing would remove competition for forage or living space between wildlife and livestock (Table 3-7). Mule deer winter ranges would no longer be used by wintering livestock and all browse would be available for deer. An overall improvement of browse should result. In a study on Morey Bench, withdrawn areas exhibited 30 percent increases in bitterbrush over an eight year period following exclusion of livestock use (Tueller and Monroe 1975).

The riparian and meadow areas would be expected to show immediate and favorable vegetative response upon exclusion of livestock (Behnke and Raleigh 1978).

All wildlife populations would be expected to increase to some extent with the elimination of grazing. Long-term effects of removal of grazing may not result in this. Once populations reach a peak they may crash or be sustained depending on habitat conditions. For a summary of impacts, see Table 3-9.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

Under this alternative, allocation for wildlife would be the same as for the proposed action except in Butterfield, Currant Ranch, Forest Moon, Morey, Smoky, Hot Creek, and Stone Cabin allotments. An increase in competition between big game and wild horses would result instead of competition with livestock. Grazing impacts would be similar to those discussed under the proposed action (Table 3-6).

Diet overlap between horses and mule deer is similar to livestock and deer except during the spring. Horses consume much more grass in the spring than livestock (USDI, BLM, Ely, 1975-1976). With the mule deer requirement for grass in early spring, some competition would occur when spring ranges overlap, particularly in areas where grass is in short supply.

Although horse and antelope diets do not significantly overlap (Meeker 1979), fall and winter browse consumption similarities could present a problem under poor range conditions. Also with forbs in short supply, competition could result in the

TABLE 3-7
IMPACTS TO BIG GAME FROM THE NO LIVESTOCK GRAZING ALTERNATIVE
(In Numbers of Animals)

Allotment	Species	Change In Numbers Short-Term a/	Change In Numbers Year 2015 a/
Blue Eagle	Antelope	0-10	0-10
	Bighorn sheep	0	0-10
Butterfield	Mule deer	(-)30-(-40)	100-110
	Antelope	0-10	0-10
	Bighorn sheep	40-50	50-60
Crater Black Rock	Mule deer	30-40	30-40
	Antelope	0-10	0-10
Currant Ranch	Mule deer	0	30-40
	Bighorn sheep	0-10	10-20
Forest Moon	Mule deer	0-10	50-60
	Bighorn sheep	0-10	0-10
Hot Creek	Mule deer	240-250	780-790
Hunts Canyon	Antelope	0-10	10-20
Ione	Mule deer	60-70	60-70
Monitor	Mule deer	10-20	20-30
	Antelope	0-10	0-10
Morey	Mule deer	(-)540-(-)550	(-)220-(-)230
Nyala	Mule deer	30-40	30-40
	Antelope	10-20	10-20
	Bighorn sheep	10-20	10-20
Ralston	Mule deer	30-40	30-40
	Antelope	30-40	30-40
Reveille	Mule deer	370-380	370-380
	Antelope	80-90	80-90
San Antone	Mule deer	390-400	390-400
Sand Springs	Mule deer	110-120	130-140
	Antelope	0-10	0-10
Smoky	Mule deer	(-)440-(-)450	(-)340-(-)350
	Antelope	0-10	0-10
Stone Cabin	Mule deer	110-120	340-350
	Antelope	90-100	90-100
Wagon Johnnie	Mule deer	640-650	640-650
	Antelope	70-80	70-80
Willow Creek	Mule deer	40-50	40-50
	Antelope	0-10	0-10
TOTALS	Mule deer	1,100-1,110	2,550-2,560
	Antelope	340-350	350-360
	Bighorn sheep	70-80	90-100

a/ "Change in numbers" refers to the change in numbers of animals from existing populations to expected populations for which allocations have been made.

Source: Data was compiled from Proposed Action tables for vegetation allocation and reasonable numbers table provided by Nevada Department of Wildlife in concurrence with BLM, compiled 1979.

TABLE 3-8
IMPACTS TO BIG GAME FROM THE LIVESTOCK REDUCTION/
MAXIMIZING WILD HORSES ALTERNATIVE
(In Number of Animals)

Allotment	Species	Change In Numbers Short-Term a/	Change In Numbers Year 2015 a/
Blue Eagle	Antelope	0-10	0-10
	Bighorn sheep	0	0-10
Butterfield	Mule deer	(-)30-(-)40	100-110
	Antelope	0-10	0-10
	Bighorn sheep	40-50	50-60
Crater Black Rock	Mule deer	30-40	30-40
	Antelope	0-10	0-10
Currant Ranch	Mule deer	0	30-40
	Bighorn sheep	0-10	10-20
Forest Moon	Mule deer	0-10	50-60
	Bighorn sheep	0-10	0-10
Hot Creek	Mule deer	240-250	780-790
Hunts Canyon	Antelope	0-10	10-20
Ione	Mule deer	60-70	60-70
Monitor	Mule deer	10-20	20-30
	Antelope	0-10	0-10
Morey	Mule deer	(-)540-(-)550	(-)220-(-)230
Nyala	Mule deer	30-40	30-40
	Antelope	10-20	10-20
	Bighorn sheep	10-20	10-20
Ralston	Mule deer	30-40	30-40
	Antelope	30-40	30-40
Reveille	Mule deer	370-380	370-380
	Antelope	80-90	80-90
San Antone	Mule deer	390-400	250-260
Sand Springs	Mule deer	110-120	130-140
	Antelope	0-10	0-10
Smoky	Mule deer	(-)440-(-)450	(-)340-(-)350
	Antelope	0-10	0-10
Stone Cabin	Mule deer	110-120	340-350
	Antelope	90-100	90-100
Wagon Johnnie	Mule deer	640-650	640-650
	Antelope	70-80	70-80
Willow Creek	Mule deer	40-50	40-50
	Antelope	0-10	0-10
TOTALS	Mule deer	1,100-1,110	2,550-2,560
	Antelope	340-350	350-360
	Bighorn sheep	70-80	90-100

a/ "Change in numbers" refers to the change in numbers of animals from existing populations to expected populations for which allocations have been made.

Source: Data was compiled from Proposed Action tables for vegetation allocation and reasonable numbers tables provided by Nevada State Department of Wildlife in concurrence with BLM, compiled 1979.

spring on common use areas. The cumulative impact would probably not be significant.

Bighorn sheep and horses do not currently occur in the same areas. Elk and horses could compete significantly in Little Fish Lake Valley because diet overlap occurs nearly year-round. However, vegetation is allocated for both, therefore, significant impacts would not be expected.

Horses tend to use riparian and wet areas heavily much like livestock. However, they do not tend to concentrate on these areas as much (Zarn et al. 1977). Competition for such habitats and probable overuse would still occur but might not be as significant as it would be with livestock.

Impacts resulting from this alternative would otherwise be much the same as on wildlife species as was discussed in the proposed action. For a summary of impacts; see Table 3-9.

WILD HORSES

PROPOSED ACTION

IMPACTS

Existing wild horse use would decrease from 26,814 AUMs (2,268 horses) to 7,242 AUMs (621 horses) and then as available vegetation increased wild horses would be allowed to increase the same proportion as livestock and wildlife in the future. Wild horse use in 35 years would be 8,286 AUMs (708 horses) as shown in Table 3-10 in accordance with the Tonopah MFP. This would result in a 73 percent reduction for the resource area, four percent for the State of Nevada, and two percent for the nation based on 1979 population levels. This reduction, as recommended in the Tonopah MFP, is necessary to bring the wild horse population into ecological balance with their environment, resulting in a long-term significant impact. All the wild horses would be removed from the Hot Creek, Morey, Nyala, Sand Springs, and Willow Creek allotments. Wild horses in the Hunts Canyon, Monitor, Ralston, Reveille, Stone Cabin, and Wagon Johnnie allotments would be reduced to optimum numbers. A total of 1,647 wild horses would be removed from the resource area and given away for adoption under the BLM's Adopt-a-Horse Program. In all allotments with wild horses (Table 1-1) vegetation would be allocated to optimum numbers of wild horses resulting in an increase in the health and vigor of the remaining horses which determines their reproductive capabilities. Average annual productivity would be higher than the current 12.5 percent (Chapter 2, Wild Horses). Because of the low productivity of horses in the wild, it is felt that a two percent increase would be a significant improvement. Data from New Mexico (Conley 1979) showed that the annual increase for wild horses was approximately 15 percent. It is felt that wild horses in the Tonopah Resource Area would have an annual increase of 15 percent in the long-term. This would be significant based on the above criteria. The 73 percent reduction would not affect the remaining wild horses, but would affect the wild horse interest groups as discussed in Chapter 3, Social-Economic Values.

The only proposed fence which would have an impact on wild horses is the right-of-way fence along U.S. Highway 6 through the Reveille allotment which would divide the Reveille wild horse use area into two separate use areas (Chapter 2, Wild Horse Use Areas Map). The fence would restrict established movement patterns of wild horses in the eastern portion of the allotment. The significance of this movement as part of the yearlong habitat, life history, or wild free-roaming nature of the horses involved is currently unknown. Because of the large variability in home ranges (Chapter 2, Wild Horses), any wild horses affected by the proposed fence would be able to establish new home ranges. Based on the findings of Green (1976) the proposed fence would not significantly impact the productivity and health of those wild horses.

Conclusion

The proposed action would have a significant long-term impact on wild horses by allowing them to live in ecological balance with their environment. An increase from 12.5 to 15 percent in the productivity of the horses would be expected as a result of the removal of 1,647 wild horses. The proposed right-of-way fence along U.S. Highway 6 through the Reveille allotment would divide the Reveille use area into two separate units, but would have an insignificant impact on the wild horses in this area.

NO ACTION ALTERNATIVE

IMPACTS

Under this alternative wild horse use would be maintained at the current level of 26,814 AUMs (2,268 horses) as shown in Table 3-10. In seven of the eleven allotments which have wild horses, the total AUMs being used by cattle and wild horses are 24,165 in excess of available vegetation (Table

TABLE 3-9
SUMMARY OF IMPACTS TO BIG GAME FROM THE
ALTERNATIVES INCLUDING THE PROPOSED ACTION

Action	Total Increase In Numbers Short-term	Total Increase In Numbers Long-term
Proposed Action	1100-1110 Deer 340-350 Antelope 70-80 Bighorn	1980-1990 Deer 350-360 Antelope 90-100 Bighorn
No Action Alternative	No Change	No Change
No Livestock Grazing Alternative	1100-1110 Deer 340-350 Antelope 70-80 Bighorn	2550-2560 Deer 350-360 Antelope 90-100 Bighorn
Livestock Reduction/ Maximizing Wild Horses Alternative	1100-1110 Deer 340-350 Antelope 70-80 Bighorn	2550-2560 Deer 350-360 Antelope 90-100 Bighorn

Source: Tables 3-6 through 3-8.

TABLE 3-10
CHANGES IN WILD HORSE USE (AUMs)

Type of Action	Current 1979	Interim Period 1981	Long-term 2015
Proposed Action	26,814	7,242	8,286
No Action Alternative	26,814	26,814	26,814
No Livestock Grazing Alternative	26,814	7,242	7,242
Livestock Reduction/Maximizing Wild Horse Alternative	26,814	23,748	48,166

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Unit Resource Analysis, 1976.

1-6). In the long-term, wild horses, wildlife and livestock forage condition and vegetation production would decline in all allotments with wild horses (Chapter 3, Vegetation), resulting in increased competition among wild horses, wildlife and livestock for available vegetation. The increased competition from a decrease in available vegetation would result in a short- and long-term significant impact on wild horse annual productivity. The two percent change in productivity as mentioned for the proposed action was used as the level of significance. The level of annual productivity would decline to the 6.6 percent observed by Green (1976) when the Stone Cabin herd was at its peak. This is a decrease of six percent from the current annual increase.

A worst case analysis would show the level of productivity nearing zero in the long-term with ten percent or more of the wild horses starving to death during severe winters as witnessed during the winter of 1976 in the Winnemucca District, BLM (Jancar, personal communication, 1979).

Conclusion

The increased competition with wildlife and livestock caused by a long-term decrease in available vegetation is expected to cause a decline in wild horse annual productivity from 12.5 percent to 6.6 percent. A decrease in annual wild horse productivity would be a long-term significant adverse impact.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Wild horse use, with this alternative, would be reduced from 26,814 AUMs (2,268 horses) to 7,242 AUMs (621 horses) as shown in Table 3-10 according to the Tonopah MFP. Impacts would be the same as for the proposed action. Annual productivity would increase from the current l2.5 percent to 15 percent. Data from New Mexico (Conley 1979) showed that the annual increase for wild horses was approximately 15 percent. Since annual productivity for the wild horses in the Tonopah Resource Area would increase by 2.5 percent and a two percent change in productivity was used to determine a level of significance, a long-term significant impact to wild horses would be expected from the No Livestock Grazing alternative. This increase in annual productivity would result from an increase in available vegetation (Table 1-8) caused by elimination of livestock grazing and reduction of wild horse numbers.

Conclusion

Based on data from other wild horse herds, a 2.5 percent increase (a change from 12.5 to 15 percent) in annual productivity would be expected in the long-term. This would be a long-term significant impact to wild horses.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

Under this alternative there would be no livestock grazing in wild horse use areas. All wild horses would be removed from the Hot Creek, Morey, Nyala, Sand Springs, and Willow Creek allotments according to the Tonopah MFP. The wild horses in the Hunts Canyon, Monitor, Ralston, Reveille, Stone Cabin, and Wagon Johnnie allotments would be allowed to increase from the existing level of 23,748 AUMs (2,011 horses) until demand reached the six use areas carrying capacity (Table 1-10) of 48,166 AUMs (4,242 horses) as shown in Table 3-10. This would result in 100 percent use of available AUMs in wild horse use areas or 26 percent use of future available vegetation for the resource area (Table 1-10). At the current rate of annual increase (12.5 percent) it is estimated that five to six years would be required to reach the carrying capacity of the use areas. During this short-term period annual productivity would be 15 percent; this increase is based on a two percent change as the level of significance would have a short-term significant impact on wild horses. However, once carrying capacity is reached annual productivity would remain 15 percent for the long-term due to continuous yearlong grazing in Reveille, Stone Cabin, and Wagon Johnnie allotments and continuous seasonal grazing in Hunts Canyon and Ralston allotments. This continuous grazing every year at carrying capacity would not allow vegetative production or livestock forage condition to improve in wild horse use areas as discussed in Chapter 3, Vegetation.

Conclusion

In the short-term annual productivity would increase from 12.5 to 15 percent. This would result in a short-term significant impact to wild horses. Annual productivity in the long-term would remain

at 15 percent as a result of continuous grazing every year at carrying capacity in the six wild horse use areas.

VISUAL RESOURCES

ALTERNATIVES INCLUDING THE PROPOSED ACTION

IMPACTS

The overall impact of grazing (or nongrazing) creates minor and gradual changes to the visual environment and hence produces no significant impacts. Specific range improvements, however, can create visual contrasts in excess of management guidelines (Appendix J) and, therefore, must be considered as significant impacts.

Appendix J, Table J-1 lists the average impact of various range improvements and gives an indication of the most restrictive visual class zone in which a project could be placed without creating a significant impact. The impacts of an improvement are the same regardless of the management alternative being considered and a brief discussion of range facilities which create potential visual impacts and Table 3-11 will serve to illustrate where significant visual impacts are likely to occur rather than a discussion of each alternative.

Spring developments commonly have high visual contrasts due to their highly visible natures and amount of vegetative change which occurs around them. It can be expected that these facilities would create a visual contrast greater than management guidelines for Visual Classes I and II, and therefore should be considered significant impacts requiring the consideration of mitigating measures if they were to occur in areas within these classifications.

Land treatments have the highest potential for visual contrasts of all proposed improvements. They generally create large areas of contrasting vegetation and in many cases create sharp lines of contrast along their edges. Contoured seedings and land treatments which do not introduce plants (seeding) would generally be designed to meet Class III contrast limits. Seedings and treatments with linear edges would generally exceed all but Class IV guidelines.

All of the other facilities in the proposed action and alternatives meet at least Class II guidelines and because there are no proposals in any Class I areas, they should be considered visually insignificant.

Conclusion

Spring developments and land treatments create the only significant visual impacts. Spring development impacts can usually be fully mitigated. Land treatments cannot be mitigated at a Class II level but would meet Class III contrast limitations.

MITIGATING MEASURES

Spring developments: high contrast ratings occur from changes in vegetation, highly visible locations, and changes in form and line due to introduction of man-made facilities. The springs, and the surrounding riparian area would be fenced to the point at which trampling would not create a substantial change in vegetation; non-reflective and natural or natural colored materials would be used and site selection would be carefully studied to the point necessary to reduce the visual contrast to acceptable levels.

Seedings: The major visual elements of seedings are the substantial vegetative color change and linear contrasts which occur on the edges of the seeding. The edges of the seedings would be contoured or "feathered" when it substantially reduces the contrasts. No mitigation measures would reduce the contrasts to a Class II level.

UNAVOIDABLE ADVERSE IMPACTS

The high visual contrast between existing vegetation and introduced species in the seedings in the Ione allotment and portions of those in the Monitor and Stone Cabin allotments are significant unavoidable adverse impacts.

CULTURAL RESOURCES

Impacts to cultural resources from grazing animals occur in two forms–trampling and rubbing. Impacts also occur, from construction of livestock support facilities, in two direct forms–mechanical and environmental alterations; and indirectly by trailing of animals along fences. Because of the incomplete cultural resources inventory data, prediction of how many cultural resources sites would be impacted by each alternative is problematic, thus a worst case assumption must be used. Methodologies for determining the probability of impacts

TABLE 3-11
SIGNIFICANT IMPACTS TO VISUAL RESOURCES BY ALLOTMENT

Allotment a/	Proposed Action	Alternative b/ Livestock Reduction
Butterfield	3 spring developments Class III contrast are c/ proposed in Class II areas	none
Francisco	2 spring developments are proposed in Class II areas	same as proposed action
Hunts Canyon	2 spring developments are proposed in Class II areas	none
Ione	2 spring developments are proposed in Class II areas; 2400 acres of seeding (Class IV contrast) c/ are proposed in a Class II area	2 spring developments are proposed in Class II areas
Monitor	8,725 acres of seeding are proposed in Class II and III areas	3880 acres of seeding are proposed in Class II and III areas
San Antone	2 spring developments are proposed in Class II areas	same as proposed action
Sand Spring	10,000 acres of seeding are proposed in Class III areas	none
Stone Cabin	half of 14,080 acre seeding is proposed in areas with Class II and III designation	none

a/ Only those allotments with significant visual impacts are listed.

b/ The No Action and No Livestock Grazing alternatives create no significant visual impacts.

c/ See Table J-1 in Appendix J.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Unit Resource Analysis, 1976.

resulting from construction of livestock support facilities are shown in Appendix I.

Cultural resources are nonrenewable and once salvaged or destroyed cannot be replaced.

PROPOSED ACTION

IMPACTS

It is estimated that a total of 698 cultural resources sites would be impacted from the construction of the proposed livestock support facilities. Table 3-12 lists the impacts by management categories. Impacts from trampling and rubbing would continue to occur from the presence of livestock and wild horses. All impacts are considered significant because cultural resources are non-renewable (Section 106 of the National Historic Preservation Act of 1966, Section 2(b) of Executive Order 11593, and Section 101(b)(4) NEPA of 1969).

On the positive side, certain aspects of the proposed action could be beneficial to cultural resources. Any action that increases vegetative cover or reduces erosion could slow down natural deterioration. Spring developments can be designed to protect associated cultural resources. Pipelines provide water over large areas, reducing the number of animals congregating in any one area and thus reducing the amount of trampling on some cultural resources sites.

Conclusion

Impacts from the construction of livestock support facilities would occur to 698 cultural resources sites. Impacts resulting from trampling and rubbing by livestock and wild horses would continue to occur, however, increased distribution of grazing animals brought about by water development would decrease these impacts. Increased vegetative cover resulting from grazing management would decrease the impacts from erosion.

UNAVOIDABLE ADVERSE IMPACTS

Data recovery or salvage of cultural resources caused by project construction involves the literal destruction of these resources in that they cease to exist in their original contexts.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

When the decision is made to salvage a cultural resource rather than to avoid it, an irreversible and irretrievable commitment of the resource is made.

NO ACTION ALTERNATIVE

IMPACTS

No livestock support facilities are proposed under the No Action alternative. However, because nearly all cultural resources sites recorded in the Tonopah Resource Area show some degree of impact due to livestock or wild horses, these impacts can be expected to continue at their current rate. Because cultural resources are nonrenewable, these impacts are considered significant.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Elimination of livestock would greatly reduce impacts caused by trampling, however, cultural resources would continue to be adversely affected due to trampling by wild horses. Because cultural resources are nonrenewable, these impacts are considered significant.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

Table 3-13 summarizes data for this alternative. Impacts occurring from the construction of livestock support facilities would impact approximately 219 cultural resources sites. Impacts due to wild horse trampling would be expected to increase. All of these impacts are considered significant, because cultural resources are nonrenewable.

TABLE 3-12
CULTURAL RESOURCES IMPACTS--
PROPOSED ACTION a/

Project Type	Open Aboriginal	Isolated Find	Euro-Am. Historic	Aboriginal Historic	Rock Shelter	Rock Art
Pipelines	34	15	20	0	0	0
Springs	15	2	4	0	1	0
Troughs	0	0	0	0	0	0
Fences	237	158	71	0	0	0
Cattle-guards	0	0	0	0	0	0
Seedings	141	--	0	0	0	0
Totals	427	175	95	0	1	0

a/ Refer to Appendix I.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. Cultural Resource files. Compiled 1979.

TABLE 3-13
CULTURAL RESOURCES IMPACTS--
LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE a/

Project Type	Open Aboriginal	Isolated Finds	Euro-Am. Historic	Aboriginal Historic	Rock Shelter	Rock Art
Pipelines	17	8	10	0	0	0
Springs	5	1	1	0	0	0
Troughs	0	0	0	0	0	0
Fences	90	60	27	0	0	0
Cattle-Guards	0	0	0	0	0	0
TOTALS	112	69	38	0	0	0

a/ Refer to Appendix I.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District Cultural Resource Files. Compiled 1979.

RECREATION RESOURCES

ALTERNATIVES INCLUDING THE PROPOSED ACTION

IMPACTS

Recreational use in the Tonopah Resource Area is light and highly dispersed except for hunting. Grazing and vegetation allocation of the proposed action and alternatives would not affect the sightseeing opportunities.

The proposed action is projected to increase hunting opportunities 20 percent, from 5,400 to 6,495 hunter days, during the short-term and 35 percent, 5,400 to 7,314 hunter days, over the long-term; see Table 3-14. A 10 percent increase or decrease is determined to be significant.

The hunter days for the No Action alternative is projected to remain the same throughout the analysis period.

Hunter days for the No Livestock Grazing and the Livestock Reduction/Maximizing Wild Horses alternatives are projected to increase the same for the short-term and the long-term periods. Hunter days would increase 20 percent from 5,400 to 6,495, during the short-term and 45 percent, from 5,400 to 7,847, for the long-term.

Conclusion

Implementation of the proposed action, the No Livestock Grazing alternative, or the Livestock Reduction/Maximizing Wild Horses alternative would significantly increase the recreational opportunities by providing increased hunter days. Hunter days for the No Action alternative are projected to remain the same.

LIVESTOCK GRAZING

PROPOSED ACTION

IMPACTS

In the short-term the proposed action would adjust the AUMs from the last five year average use for a net increase of 7,449 AUMs (118,941 to 126,390). This represents a six percent increase of available AUMs to livestock in the short-term which would not be significant because it is less than 15 percent. This adjustment would result from an increase of 16,085 AUMs on 12 allotments and a decrease of 8,636 AUMs on eight allotments (Table 1-1). The proposed action in the long-term would adjust the AUMs from the last five year average use for a net increase of 40,533 AUMs (118,941 to 159,474). This represents an increase of 34 percent over the last five year average use and would be a significant increase because it is more than 15 percent. An increase of 45,340 AUMs in 15 allotments and a decrease of 4,807 AUMs in five would result from the above adjustment (Table 1-2). Adjustments by permittee are shown in Table 3-15 of the Social-Economics section for the short-term and long-term.

A more significant impact would result in the short-term from the proposed periods-of-use (Table 1-1) which would be in effect until AMPs are implemented. This would affect all allotments in the short-term with the exception of Wagon Johnnie and Willow Creek which are currently under AMPs. In the long-term, as AMPs would be implemented, periods-of-use would no longer be in effect except in three allotments (Blue Eagle, Butterfield, and Francisco) which are not designated for proposed AMPs. These proposed periods-of-use have a minimum of two months off in the spring which would have a significant impact on some operators. Requiring permittees to provide alternative sources of feed for any time period over two weeks would be a significant impact. Because private rental pastures are not available in the resource area, most permittees would be forced to buy feed and put their livestock in a feedlot, truck their livestock out of the resource area to rental pastures, or go out of the livestock business. It cannot be predicted what each permittee would do with their livestock during the two months since it would be a decision made by each individual permittee. Because most of the above actions translate into economic impacts, they are also discussed in the Social-Economic Values section of this chapter.

As shown in the Vegetation section of Chapter 3, livestock forage condition would improve significantly under the proposed action in the long-term. This improved forage quality and increased forage availability would result in improved nutrition essential to reproduction, lactation, growth, and fattening processes of livestock. The following changes in livestock production are based on cited references and professional judgement. Kothmann et al. (1970) showed that percent calf crop increased from 88.2 percent under continous grazing to 93.7 percent under a four pasture deferred-rotation system over an eight year period. From this it was determined that under the proposed action the calf crop would increase an average of 3-5 percent in

TABLE 3-14
ESTIMATED INCREASE IN HUNTER DAYS a/

Type of Action	Existing Hunter days	Short-Term Hunter days b/	Percent Increase	Long-Term Hunter Days c/	Percent
Proposed Action	5,400	6,495	20	7,314	35
No Action Alternative	5,400	5,400	0	5,400	0
No Livestock Grazing Alternative	5,400	6,495	20	7,847	45
Livestock Reduction/ Maximizing Wild Horses Alternative	5,400	6,495	20	7,847	45

a/ Hunter day projections were based on wildlife information published by the Nevada Department of Wildlife.

b/ The short-term increase in hunter days is projected to occur by the end of the implementation period 1987.

c/ The long-term increase in hunter days is projected to occur by the end of 35 years --year 2015.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District. Tonopah Grazing Environmental Impact Statement Files, compiled 1979.

TABLE 3-15
CHANGES IN RANCH OPERATIONS BY SIZE CATEGORY a/ (AUMs)
PROPOSED ACTION AND LIVSTOCK REDUCTION/MAXIMIZING WILD HORSES b/

	Existing Situation c/				Proposed Action					Livestock	Reduction/Maximizing Wild Horses	
	1978 Authorized Livestock Demand (AUMs)	Five Year Actual Use AUMs	1978-79 Actual Use AUMs	Dependency of Operators on the Tonopah Resource Area d/	AUM Allocations e/ Initial AUMs	AUM Allocations e/ Future AUMs	AUMs Conflicting With Periods-of-Use f/	AMP-Rancher Maintenance Costs ($) g/	Implementation Assumption AUMs h/	AUM Allocation Initial	AUM Allocation Future i/	AMP-Ranches Maintenance Costs($) g/
Small Ranches												
A	120	120	120	25%	120	134	0	$22	120	86	115	28
8	1,030	1,030	1,030	43%	1,030	1,150	310	194	1,030	739	983	237
C	1,892	1,332	1,887	88%	1,572	2,020	176	274	382	0	0	0
0	177	62	NU		177	180	NU	0	177	40	40	0
E	1,299	1,008	1,114	74%	1,114	1,171	220	110	1,114	1,114	1,228	400
F	2,024	1,287	435	53%	1,505	1,565	82	380	1,505	1,331	1,413	1,110
SUBTOTAL Small	6,542	4,839	4,586		5,518	6,220	788	$980	4,328	3,310	3,779	$1,775
Medium Ranches												
G	940	681	564	9%	940	1,474	564	$169	940	877	940	136
H	105	105	105	11%	105	106	105	0	105	24	24	0
I	4,779	1,464	1,514	50%	2,934	3,071	500	525	2,934	633	633	0
J	253	65	81	1%	36	36	68	0	36	0	0	0
SUBTOTAL Medium	6,077	2,315	2,264		4,015	4,687	1,237	$694	4,015	1,534	1,597	$136
Large Ranches												
K	14,532	11,095	9,163	76%	12,810	15,682	2,702	1,475	6,123	0	0	0
L	25,730	25,797	25,730	84%	25,730	28,383	4,878	3,020	16,347	0	0	0
M	18,557	16,506	17,107	70%	17,047	21,810	3,246	3,415	16,959	6,022	6,696	741
N	20,743	17,559	20,285	29%	12,070	14,966	2,826	2,015	10,041	7,880	9,350	276
0	16,157	13,741	16,473	86%	12,029	13,752	2,400	1,080	11,449	3,651	3,651	0
P	7,407	7,212	7,161	79%	5,914	7,287	1,710	836	3,727	263	289	29
Q	5,848	3,449	3,300	30%	5,848	9,168	300	1,053	5,848	5,457	5,848	847
R	18,176	13,612	14,259	36%	15,638	22,396	3,697	3,108	15,610	14,119	17,964	2,668
SUBTOTAL Large	127,150	108,971	113,478		107,086	133,444	21,759	$16,002	86,104	37,392	43,798	4,561
TOTAL											49,174	$6,472
Cattle Ranches	139,769	116,125	120,328		116,619	144,351	23,784	$17,676	94,447	42,236		
Sheep											1,350	195
S	1,350	23	NU		1,350	2,116	NU	$243	1,350	1,260	927	65
T	927	513	288	4%	822	1,263	0	137	736	579	788	56
U	788	NU	NU		698	1,073	NU	116	625	492	928	65
V	928	NU	NU		822	1,262	NU	137	736	580	2,221	157
W	2,221	1,296	NU		1,969	3,023	NU	329	1,763	1,387	2,338	339
X	2,338	984	2,333	11%	2,338	3,665	143	421	2,338	2,182	810	57
Y	810	NU	NU		718	1,103	NU	120	643	506	1,189	84
Z	1,189	NU	NU		1,054	1,618	NU	176	944	743		
TOTAL Sheep	10,551	2,816	2,621		9,771	15,123	143	$1,679	9,135	7,729	10,551	$1,018
TOTAL Livestock	150,320	118,941	122,949		126,390	159,474	23,927	$19,355	103,582	49,965	59,725	$7,490

NU = Nonuse.

a/ Tonopah Resource Area.

b/ No Action alternative based on five year average use (existing situation); No Grazing alternative would eliminate grazing based on five year average use.

c/ Based on Table 2-14, more detail in Appendix K-1.

d/ No information available for dependencies not shown.

e/ Initial and future AUMs allocations based on percent of permittee's 1978 authorized livestock demand and proposed allocations (see Tables 1-1 and 1-2).

f/ Number of AUMs in 1978-79 license in conflict with proposed periods-of-use (see Table 1-1).

g/ Costs apportioned based on percent of permittees 1978 authorized livestock demand.

h/ AUMs temporarily reduced from livestock use because of excess wild horse use (see Basic Assumption Number 1 and Table 3-1 at the beginning of this Chapter).

i/ Initial and future AUMs based on percent of permittee's 1978 authorized livestock demand, and proposed allocation (see Table 1-9 and 1-10).

the long-term. This would mean an increase in percent calf crop from 70-73 percent currently to 73-78 percent in 35 years. Any increase over three percent would be considered significant. Calf weaning weights would increase an average of 10-20 pounds in the long-term. This translates to an increase from 350-400 pounds currently to 360-420 pounds in the long-term. In the same study, Kothmann, et al. (1970) showed calf weaning weights increased from 501 pounds under continous grazing to 521 pounds under a four pasture deferred-rotation system. Any increase over 10 pounds would be considered significant. Death losses would be assumed to remain constant at 4-5 percent since no data supporting change is available.

Implementation of the proposed grazing systems and periods-of-use would necessitate moving of livestock several times throughout the year. Some permittees could adjust to this situation with their present work force, while other permittees would be forced to hire additional employees to handle the increased workload. The number of additional employees that would need to be hired is unquantifiable at this time. This would not change the method of operation, but would add to the cost of the operation. Any increase in the work force would be considered significant.

Administration problems such as overuse and trespass which were discussed in Chapter 2 would be significantly reduced as a result of the proposed action. Managing each allotment at or below grazing capacity would alleviate the current overuse problem. Regular herd checks and more handling of livestock as required by the proposed grazing plans would help to minimize the trespass problems. Alleviation or minimization of current major administration problems would be considered a significant change.

Conclusion

In the short-term the proposed action would initially adjust the AUMs from the last five year average use for a net increase of 7,449 AUMs (118,941 to 126,390). A net increase of 40,533 (198,941 to 159,474) from the last five year average would be realized from the proposed action in the long-term. The short-term change would not be significant while the long-term change would be significant.

Some operators would have to reduce the size of their herds, buy feed, move to rented pastures, or go out of the livestock business as a result of the proposed adjusted stocking rates and periods-of-use. In the long-term the calf crop would increase 3-5 percent, weaning weights would increase 10-20 pounds as a result of improved forage quality and increased forage availability. Administration problems such as overuse and trespass would be alleviated or minimized.

UNAVOIDABLE ADVERSE IMPACTS

In the short-term some operators would be forced to reduce their herds, move to rented pastures, go out of the livestock business, or buy feed as a result of the reduction in stocking rates and proposed periods-of-use.

NO ACTION ALTERNATIVE

IMPACTS

This alternative proposes that all livestock use would continue at the last five year average use level as described in Table 1-6. Calf weights, death loss, and percent calf crop would remain as they are described in the Livestock Grazing section of Chapter 2. The normal operation for livestock permittees would also remain as described in Chapter 2.

NO LIVESTOCK GRAZING ALTERNATIVE

IMPACTS

Under this alternative all red-meat production and other livestock benefits derived from BLM lands in the resource area would cease. It was determined that any permittee with more than 15 percent dependence on the Tonopah Resource Area would be significantly impacted as a result of the loss of their grazing preference. As shown on Table 2-14 in Chapter 2, 13 of the 26 livestock permittees in the Tonopah Resource Area have 15 or more percent dependence on the resource area. These ranchers would be forced to reduce their herds to a size that could be maintained on their base property, or public lands outside the resource area, buy feed, rent pasture outside the resource area, or go out of the livestock business. The remaining 13 livestock permittees have less than 15 percent dependence on the Tonopah Resource Area and therefore would not be significantly impacted.

UNAVOIDABLE ADVERSE IMPACTS

Thirteen of the 26 livestock permittees would be significantly impacted. These ranchers would be forced to reduce their herds to a size that could be maintained on their base property or public lands outside the resource area, buy feed, rent pasture outside the resource area, or go out of the livestock business. These impacts would be unavoidable.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

In the short-term this alternative would initially adjust the AUMs from the last five year average use for a net decrease of 68,976 (118,941 to 49,965) AUMs. This adjustment would result from a decrease of 75,373 AUMs in 15 allotments and an increase of 6,397 AUMs in 5 allotments (Table 1-9). This represents a 58 percent reduction which is greater than 15 percent and therefore significant. In the long-term, AUMs would be adjusted from the last five year average use for a net decrease of 59,216 (118,941 to 59,725) AUMs. An increase of 15,431 AUMs in 14 allotments and a decrease of 74,647 AUMs in 6 allotments would result in the above adjustment (Table 1-10). This represents a 50 percent reduction which would be a significant reduction because it is greater than 15 percent. Adjustments by permittee are shown in Table 3-14 for the short-term and long-term. Five allotments (Table 1-9) would have no livestock grazing on 1,258,420 acres. All of the permittees in these five allotments are highly dependent on the Tonopah Resource Area, with the exception of Forest Moon, and would be forced to sell their operations. Eight allotments (Butterfield, Crater Black Rock, Currant Ranch, Hot Creek, Morey, Nyala, Ralston, and Willow Creek) would receive a significant reduction (more than 40 percent) in livestock AUMs. All of the operators who use these allotments, with the exception of Currant Ranch, are also heavily dependent on the Tonopah Resource Area (Table 2-14). All would be forced to reduce their herds, or find alternate sources of pasture or feed, or go out of the livestock industry. No significant changes in calf crops, weaning weights or death losses would result from implementation of this alternative in these eight allotments.

The remaining seven allotments (Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky) would receive less than a 40 percent reduction and would have intensive grazing management. These permittees would experience the same impacts as discussed in the proposed action of this section for allotments under intensive grazing management.

Conclusion

In the short-term, the proposed action would initially adjust the AUMs from the last five year average use for a net decrease of 68,976 AUMs (118,941 to 49,965). In the long-term, AUMs would be adjusted from the last five year average use for a net decrease of 59,216 AUMs (118,941 to 59,725). All of the permittees would be impacted, being forced to either sell out, find additional sources of feed, or significantly reduce their operations.

UNAVOIDABLE ADVERSE IMPACTS

Significant impacts to those permittees who would receive more than a 40 percent reduction would be unavoidable. Most would be forced to sell their operations or significantly reduce their herds.

WILDERNESS POTENTIAL

ALTERNATIVES INCLUDING THE PROPOSED ACTION

IMPACTS

An intensive inventory has tentatively identified 11 areas within the Tonopah Resource Area that may meet the criteria for further wilderness study (Proposed Wilderness Study Areas map). Following a public comment period a decision will be made by the BLM Nevada State Director by September 1980 on which areas will be designated as Wilderness Study Areas (WSA).

Within a WSA, the wilderness Interim Management Policy (IMP) provides for continuation of existing grazing uses in the same manner and degree in which they were conducted on October 21, 1976, but these must cause no unnecessary or undue degradation of the lands and their resources, and they must afford environmental protection. Expansion or curtailment of grazing use and changes in numbers, periods-of-use, and kinds of livestock may be allowed so long as these activities meet the guidelines set forth in the IMP. This would include implementation of and changes in grazing systems.

Use and maintenance of existing range improvements would be allowed so long as this would not cause undue or unnecessary degradation of wilderness values. New range improvements needed to support and facilitate grazing use and management may be installed and maintained so long as the activities and structures meet the guidelines of the IMP. Some range improvements such as fences, cattleguards, well or spring developments, trails, and corrals would likely be allowed in Wilderness Study Areas under careful controls to prevent changes in the area's wilderness suitability. Range improvements which make substantial changes on the surface such as vegetation manipulation (spraying or burning and seeding) or large reservoirs would not be allowed if they would impair an area's wilderness suitability.

Based on the foregoing discussion, the identification of Wilderness Study Areas in September of 1980 would have a significant bearing on implementation of the proposed action or alternatives. The guiding principle when implementation begins is that no action would be allowed which would impair an area's suitability for wilderness designation.

Given these guidelines, there would be no significant impacts to wilderness values from the proposed action or any of the alternatives. Grazing will not significantly increase in manner or degree. There are no land treatment projects proposed for areas intensively studied for wilderness values. Individual projects would be subject to review as stated in the Standard Operating Procedures of Chapter 1.

SOCIAL-ECONOMIC VALUES

INTRODUCTION

The proposed action and alternatives would directly impact ranchers, hunters and those who have concerns about the management of wildlife and wild horse resources. Through social and economic links, indirect impacts would occur to residents of the impact region. Nye County is the primary geographic area considered. The order of analysis, where applicable, is to first analyze direct impacts and second to analyze indirect impacts. Because of the close inter-relationship of social and economic impacts, it was felt that a joint section was appropriate for the analysis.

Economic impacts as a result of changes in watershed not captured in improved livestock forage and non-hunting recreational activity were not evaluated due to the determination that these resources would not be significantly impacted (Chapter 3, Recreation Resources and Soils). Economic impacts as a result of changes in small game hunting and fishing were not evaluated due to lack of quantification of changes in these resources.

Relevant methodologies and computations not contained in this section can be found in Appendix K.

PROPOSED ACTION

IMPACTS

Ranchers

The proposed action would directly impact Tonopah Resource Area ranchers in the short-term by the reduction in the number of preference AUMs, the change in periods-of-use, the development of Allotment Management Plans (AMPs); and through the reduction and maintenance of wild horse herds. In the long run, 34 percent more AUMs would become available for livestock grazing. Each of these impacts will be discussed separately.

AUM Reduction

Five cattle ranchers are scheduled for AUM reduction from the five year average use level (Table 3-15). Four of those scheduled to have reductions operate large ranches (over 800 head) and one operates a medium ranch. Two ranchers are scheduled for reductions of 67 AUMs and 29 AUMs from five year average use. The AUM reduction is a reduction of less than 0.4 percent of total requirements for both of these operators. Yearly income loss would be $1,400 based on costs of hay feeding (96 AUMs x 1 ton of hay per 4 AUMs x $60 per ton of hay).

The remaining three ranchers would have to substantially reduce the size of their operations or incur substantially higher costs. Based on an average reduction of 2,833 AUMs for the three ranchers, net ranch income would decline from $266,400 to $188,500 if hay is purchased and $108,800 if herd size is reduced (Table 3-16 summarizes these impacts).

These three ranchers have expanded their operations within the past five years. Implementation of the proposed action would reverse this trend toward expansion, and perhaps cause these ranchers to re-evaluate their long-term ranching goals.

TABLE 3-16
ECONOMIC IMPACTS TO LIVESTOCK RANCHES--PROPOSED ACTION

	Existing Situation	Initial AUM Reduction: Hay Purchase	Initial AUM Reduction: No Hay Purchase	Period-of-Use: Hay Purchase	Period-of-Use: No Hay Purchase	Implementation Assumption a/: Hay Purchase	Implementation Assumption a/: No Hay Purchase	Future AUM Allocation: Increased No Hay Purchased	Future AUM Allocation: Decreased Hay Purchase
Cattle									
Small Number Operators Impacted	6	0	0	4	4	1	1	6	0
Average AUM Change				Off-April, May		-950	-950	+243	
Total Gross Income	26,874			26,874	No source	26,874	5,374	29,655	
Cash Costs	9,250			14,189	of feed	26,032	6,278	19,904	
Operator and family labor	7,448			7,892		8,972	1,489	8,738	
Returns above cash costs and family labor	10,176			4,793		Negative	Negative	11,166	
Net ranch income	6,812			1,429		Negative	Negative	7,802	
Remaining Change b/	0	0	0	0	0	0	0	0	0
Medium Number Operators Impacted	4	0	0	4	4	0	0	2	0
Average AUM Change				Off-April, May				1,200	
Total Gross Income	69,479			69,479	No source			74,054	
Cash Costs	35,272			46,984	of feed			36,900	
Operator and family labor	10,000			10,506				10,000	
Returns above cash costs and family labor	24,207			11,989				27,154	
Net ranch income	19,369			7,151				22,316	
Remaining Change b/	0	-440	-440	0	0	-440	-440	0	-440
Large Number Operators Impacted	8	3	3	8	8	5	5	5	1
Average AUM Change		2,833	2,833	Off-April, May		-5,543	-5,543	3,867	-2,593
Total Gross Income	436,122	428,904	240,627	436,122	150,926	436,122	222,888	492,025	436,122
Cash Costs	138,831	208,687	100,905	219,495	71,399	241,136	95,968	145,903	187,143
Operator and family labor	16,837	17,667	16,837	18,037	16,837	18,331	16,837	16,899	17,542
Returns above cash costs and family labor	280,454	202,550	122,885	198,590	62,690	176,655	110,083	329,223	231,437
Net ranch income	266,394	188,490	108,825	184,530	48,630	162,595	92,023	315,058	217,377
Remaining Change b/	0	-1,010	-1,010	0	0	0	0	+1,290	0
Sheep Number Operators Impacted	8	0	0	1	0	0	0	8	
Average AUM Change				-143				+1,538	0
Economic costs based on hay feeding c/				-$2,145				$15,380	
Total Changes in Net Ranch Income d/		$235,200	$474,100	$727,500	$1,849,000	$130,900 e/	$85,400 e/	$210,100 f/	

a/ Impacts temporarily occurring to livestock because of excess wild horse use (see Basic Assumption Number 7 and Table 3-1 at the beginning of this Chaper).

b/ AUM changes of less than one percent in total feed sources were evaluated in terms of cost of substitute hay at $60 per ton.

c/ Decreases in AUMs were evaluated using costs of substitute hay, increases were evaluated using an average income change of $10 per AUM.

d/ Change in net ranch income = Sum by size category of [(existing net ranch income-changed net ranch income) x number of operators impacted] + remaining changes. Negative income evaluated at zero income.

e/ Additional change from initial AUM Reduction only.

f/ Change in ranch income is the sum of the increase and decrease columns of cattle ranchers only.

Source: Gee, Kerry, 1980. Economics, Statistics, and Cooperatives Service, Agriculture Economist, personal communication. Fort Collins, Colorado, 1980.

Because these three ranchers control approximately 32 percent of the AUMs in the resource area, their operational response to the proposed AUM reductions may well have social and economic implications area wide.

Wild horses would be removed and MFP recommended numbers would be maintained in six wild horse use areas. Wild horses are currently in 11 allotments. Until wild horses are removed, cattle would be removed to prevent the deterioration of the public lands (Chapter 3–Basic Assumptions, Number 7).

Six cattle ranchers would have additional AUM reductions from the five year average use over the proposed allocations until wild horses are removed (Table 3-15). Additional reductions range from 5 to 71 percent. Economic losses, based on a 71 percent reduction for the small ranch and an average 38 percent total reduction (proposed action and implementation assumption) for large ranches over five year average use, is shown on Table 3-16. The rancher's ability to sustain these losses would depend on the duration of the loss and his wealth/capital position. Although the loss would be temporary, some ranchers might not be able to sustain even a short term loss and might be forced to sell the ranch.

Eleven of the eighteen cattle ranchers and six of the eight sheep ranchers would have their authorized grazing use reduced (Table 3-15). Although BLM does not recognize the right to treat grazing permits as real property, they are bought and sold and used as collateral for loans (McConnen 1976); (Stubblefield and Robertson, no date); (Neilsen and Workman 1971). The proposed changes in the number of AUMs would cause a decline in the capital position (wealth) of these ranchers. In 1981 the total decrease would be 23,930 AUMs (from 150,320 to 126,390). At a market value of $50 dollars per AUM (Falk 1980) the total decline in the capital position would be $1,196,500. The decline in capital position would be an actual dollar value only if the ranch or a portion of the ranch is sold, leased, or used as collateral for a loan.

Periods-Of-Use Changes

The proposed action would establish periods-of-use for allotments in the Tonopah Resource Area (Table 1-1). Seventeen of the 18 cattle ranchers and one sheep rancher would have periods-of-use conflicts under the proposed action when compared with the 1977-78 licensed use. Period-of-use conflicts affect all size categories of cattle operations. On an individual rancher basis, the percentage of total AUMs that are currently utilized during periods that would not be permitted in the future ranges from 6 to 100 percent (Table 3-15).

The impacts of these conflicts can be highly significant for several reasons. Forage on public lands within the resource area provides a critical link to some operators who, in the words of one rancher, "have no place else to go." Although some ranchers might be able to reduce herd size to adjust to the proposed periods-of-use, many ranchers would have to buy hay, truck their cattle to locations outside the area, or go out of the livestock business. Consequently, that portion of the proposed action that would impose a periods-of-use constraint would require some of the area ranchers to dramatically alter their method of operation to accommodate this constraint. For the majority of the ranchers, the implementation of this element of the proposed action would require a more capital and labor intensive form of management than heretofore has been required. To derive economic losses for period-of-use changes, it was assumed that the typical ranch would be required to be off public land for two months in the spring (April and May). Table 3-16 shows the result of this constraint by size category. For the typical small and medium ranches, purchased hay is the only economically viable source of alternative feed for these critical months. Typical large ranches could significantly reduce herd size, as an alternative to purchased hay, but at a much greater economic loss.

Only one sheep rancher is affected by the period-of-use constraint. He would be required to be off the allotment six days earlier than his current period-of-use requires. If alternative grazing cannot be obtained, hay feeding his herd could cost $2,145 (143 AUMs x 1 ton of hay per 4 AUMs x $60 per ton of hay).

Total direct net income loss based on purchased hay would be $727,500, a 27 percent decline from the $2,620,900 net income generated by area ranchers. Total loss by size category follows: small ranches–$21,532 (4 x $5,383); medium ranches–$48,872 (4 x $12,218); large ranches–$654,912 (8 x $81,864); and sheep–$2,145.

Some ranchers ability to borrow additional money to cover the higher costs would be diminished by lowered incomes and lowered wealth position as a result of AUM reductions. In addition, the above loss represents an average while some ranchers may face substantially higher costs. A combination of these factors could force some ranchers out of business.

In the long run, a period-of-use constraint may have some positive economic benefits. The requirement that the herd be rounded up may encourage

such management practices as pregnancy testing, controlled seasonal calving, supplemental feeding, etc. This could lead to higher calving percentages and larger calves which could increase ranching profits.

Allotment Management Plans

To develop AMPs in the resource area, numerous livestock support facilities have been proposed (Appendix B, Section 1). Normal cooperative agreements require the ranchers to maintain fences and cattleguards while BLM maintains water developments and seedings (Chapter 1, Standard Operating Procedures). The additional costs to the ranchers of maintenance is shown in Table 3-15 (Appendix K for methodology). Average additional costs per size category are $163 per year for small ranches; $437 per year for medium ranches; $1,869 per year for large ranches; and $210 per year for sheep ranches.

In some cases, the development of grazing systems might result in the rancher returning to a year-round operation which could result in a reduction of some of the costs discussed in the previous section. In addition, grazing systems may encourage more intensive management practices which could result in additional rancher profits.

The majority of the ranchers with whom discussions were held, (55 percent) appeared skeptical when discussing the development and implementation of Allotment Management Plans (AMPs). In an area where rains are unpredictable and spotty, these ranchers felt that AMPs do not allow the flexibility to utilize available forage. They also felt that the expense of implementing an AMP simply would not be worth it. Of those ranchers who appeared skeptical about AMPs, the general consensus seemed to be that, in an essentially desert type operation, the most cost effective and efficient way of controlling livestock movement is by controlling water sources rather than spending millions of dollars for miles of fences. Other ranchers contacted (44 percent) felt positive about development and implementation of AMPs with several saying "that's the only way to go." However, this group of ranchers expressed serious reservations about AMPs that would require a "major realignment of operators" in allotments. Several of these ranchers stated that individual livestock operators vary to some degree in cattle management practices. Consequently, a major realignment of operators within the resource area may, in the opinion of some of these ranchers, create a potential conflict situation. If operators with different management strategies and/or who run different types of cattle are forced to combine in allotments as a result of implementing AMPs, the potential for conflict could adversely affect the AMP implementation process.

Long-Term AUM Increases

In the long-term, i.e., year 2015, AUMs available to livestock would increase by 34 percent. Only one large ranch operation would still be below the five year average use. Increased returns to typical cattle ranches are shown on Table 3-16. Increases to sheep operators would be $123,000 based on a typical return of $10 per AUM. However, a considerable amount of the sheep AUMs are not currently utilized and actual increases would be only a fraction of this amount.

Total area increases in ranch income would be $210,000 based only on cattle AUMs. Output increases would total an additional $1,907,000 by the year 2015. These increases could be even greater if ranchers institute improved management practices as a result of the proposed action.

Although BLM does not recognize the right to treat grazing permits as real property, the long-term increase in AUMs would also increase the worth of the ranch if sold or used as collateral for loans. The long-term increase in rancher wealth area wide would be $507,500 (10,150 AUMs x $50 per AUM).

Ranching Community

If the resource area ranchers feel forced to dispose of their area ranching assets as a direct result of the proposed action, a great deal of vocal anger and hostility would probably be directed at BLM. It could be expected that this anger and hostility would find expression and some support in the local, regional, and state news media. This, in turn, could bring political pressure to bear at both the state and national levels of government in an orchestrated effort to get BLM to modify, mitigate, or negate the proposed action. Since the ranchers who would incur the most severe AUM reductions are some of the largest operators in the resource area, their response to the proposed action would be closely monitored by cattle industry members throughout the state and may well influence the tone and direction taken by others in the cattle industry toward subsequent BLM land management decisions statewide.

In the short-term, those ranchers scheduled for reduction who have recently incurred large financial obligations to support the expansion of their ranching operations may be faced with a financial crisis of such magnitude that their ranching operation may be in imminent peril. Should this occur, they would be faced with a painful dilemma–whether to

liquidate their ranching assets or try to remain and ride it out.

For those ranchers who view ranching in business terms first and lifestyle terms second, the implementation of the proposed action may cause them to reappraise their personal situation with a view toward liquidating their assests in the Tonopah Resource Area and re-investing those assests in other agricultural or business opportunities where returns on investments would appear to be more stable and profitable.

For some of those ranchers who currently work off-ranch, part-time to supplement their ranching income, the implementation of the proposed action may force them to seek full-time, off-ranch employment in order to accumulate the additional capital to handle the added expenses that would be required to maintain their ranching operation at current levels. However, off-ranch, full-time employment opportunities, especially in the more remote parts of the resource area, are extremely limited. Due to the distances involved, commuting to work out-of-area is not, in most cases, a viable alternative. Under these circumstances, the sale of livestock or the ranch becomes a distinct possibility. Thus, displacement of some ranching community members from the livestock industry or the area may become a reality. Displacement of ranching community members would probably accelerate the trend toward corporate acquisition of family owned-ranches, thus hastening the demise of that element of the nations ranching culture. In the long-term this could significantly alter the social and political composition of the ranching community with absentee corporate ranch owners replacing the ranching family as owner operator of resource area ranchers. Whether individual ranchers would or could hang-on under these circumstances is a highly speculative matter. Some ranchers would probably elect to tough it out–especially those whose commitment to both ranching and the area is, in their words, "irreversible." The displacement of a single ranching family would be a significantly adverse impact to that family.

The continuous threat of economic collapse due to low cattle prices, increased grazing fees, or changing government criteria all tend to create and sustain a sense of frustration and uncertainty that most often finds expression in the resource area in anti-federal government rhetoric. The perception is constantly articulated that "ranching in Nevada would be much better without the Feds." This perception would continue to exist and perhaps even grow as long as the federal government is the predominant landowner in the area. Implementation of the proposed action would probably intensify rancher support of state legislative actions such as the Sagebrush Rebellion (Chapter II, Social-Economic Values).

Other User Groups

An additional $22,460 could be spent in Nye County as a result of increased hunting of big game species in the short-term (Appendix K). The increased expenditure could mean an additional $9,770 in income and 1.4 "work years." In the long-term an additional $40,720 could be generated in expenditures resulting in an increase of $17,710 and an employment of 2.6 work years. Both short- and long-term changes would represent an increase of less than one percent in income and employment in the trade and services sector.

The additional income and employment generated by hunting to the local residents is not the only value attached to wildlife. Additional expenditures and hence additional income and employment may be generated outside the area. Hunters may also be willing to pay more than the hunting experience costs. Using dollar measures of value the increase in value in the short-term would be $82,260. In the long-term the increase in value would be $153,260 (Appendix K). In addition to the hunters, recreationalists attach a value to viewing wildlife. Lime and Cushwa (1969) suggest that wildlife is an aesthetic benefit to many recreation users, but is not a prime motivational factor attracting them to particular recreation facilities. Payne and DeGraff (1975) suggest, however, that some forms of wildlife viewing are increasing as a recreation experience.

While wildlife increases would be viewed favorably by local area hunters and business persons, there may be some adverse effect. For example, increases in wildlife populations may be the source of potential conflicts if greater numbers of out-of-area hunters are drawn to the area by increased hunting opportunities. Under these circumstances, local area hunters may be displaced from their favorite hunting areas. Should this occur, the increase in wildlife populations may be viewed negatively by area residents. Wildlife interest groups at the local, state and national levels could be expected to support increases in wildlife populations.

The economic impacts to the communities in Nye County from any reduction in wild horse numbers is expected to be slight. From a social values point of view, however, numerous persons, on a local, regional, and national basis, attach an emotional, sentimental, historical, and/or aesthetic value to the preservation of wild horses in their natural environment. Although many of these persons have not personally viewed wild horses in their natural habitat, they are vitally concerned

about the management and preservation of this resource. Their concern is focused and generally most forcibly expressed by one or more of the various wild horse interest groups whose membership extends across the United States and includes members from all walks of life (Lappin, President of Wild Horse Organized Assistance, Inc. and Riley, President of International Society for the Preservation of Mustangs and Burros, personal communications, 1979). Additionally, Mark Rey (1975) reports that there are others, primarily public lands recreationists, who "derive a sense of satisfaction from simply knowing that wild horses exist. For others, viewing wild horses provides an opportunity to experience superlative examples of natural environments and, at the same time, to gain a feeling of historical heritage. For some users an opportunity to see wild horses becomes what is defined by Tocher and Kopp (1975) as a 'peak recreation experience.'" Because approximately 58 percent of the nation's wild horse resources (USDI, BLM, Nevada State Office, "Nevada Statistics," 1978) are located on private or BLM-administered public lands in Nevada, any management decision that proposes to reduce wild horse numbers would most likely be of some local, regional, or national concern. Those interest groups whose main concern is the management of wild horse and burro habitats may indicate some reservations about the specific proposed wild horse use areas unless assured that wild horses and burros are not to be shunted off to the least desirable and least productive areas of the public domain. Although viewed positively by many area residents, the reduction of the wild horse population by approximately 73 percent in the resource area may well become a potential source of conflict between BLM and those nationwide who would prefer to see greater numbers of these free roaming animals in a greater number of areas even though this represents only a four percent reduction in statewide wild horse resources and two percent reduction in national wild horse resources (Chapter 3, Wild Horses). Others, particularly members of the resource ranching community, could be expected to favor both the reduction in numbers as well as a lesser number of wild horse use areas. Long-term increases in wild horse numbers would probably not be supported by the ranching community if AUMs are taken from livestock to increase wild horse AUMs. However, both ranchers and many of those who are vitally concerned about the preservation of this resource may welcome the implementation of a wild horse management program in the resource area even though that program does not respond to all of the perceptual requirements of the various user groups of the public domain. Although the reduction in the number of wild horses and wild horse use areas may reduce viewing opportunities, that impact cannot be quantified due to the lack of data on the utilization of current viewing opportunities. In the long-term the implementation of a wild horse management program would assure the controlled growth of healthy wild horses.

INDIRECT IMPACTS ON REGIONAL OUTPUT, INCOME, AND EMPLOYMENT

Changes in the total output, income, and employment are shown in Table 3-17. Initially a decline of 8,595 cattle AUMs would result in a decline of $384,000 in regional output, $155,000 in regional income, and 6.4 work years in regional employment. Regional output losses would total $1.3 million if cattle are removed until wild horse numbers are reduced (Implementation Assumptions). Under these assumptions, employment would decline 21.2 work years and income would decline $515,000. This represents a decline of less than one percent of the regional totals in 1977. Agriculture is the major sector that is impacted.

In the short-term several things would occur as a result of the proposed action to generate regional income and employment. An additional $22,460 in hunter expenditures would be generated. To implement the proposed action, the Tonopah Resource Area Office of BLM could hire an additional ten employees.

The proposed action calls for $3 million in construction expenditures from 1983 to 1988 for range improvements. An examination of district files reveals, however, that no contracts for range improvements went to Nye County firms from 1977-1979. Should this pattern of contract awarding continue, it could be assumed that no range improvement contracts would go to Nye County firms. Contracting firms from outside the area may spend money for food, gasoline, and lodging while in the area. No attempt was made to quantify these expenditures.

Maintenance costs for range improvements are divided among BLM, ranchers, and other parties (Chapter 1). Although maintenance is a direct cost to ranchers, the government, etc., it does provide a source of income and employment for the community. This represents expenditures of $39,700 annually starting in 1987 which represents an income of $11,900 and 0.8 work years.

Total regional output would decline as a result of short-term changes by $216,000. Income, however, would increase by $26,000 and employment would increase by 10.2 work years. This is primarily a result of gains in the government and trade sectors.

TABLE 3-17
ECONOMIC IMPACTS ON NYE COUNTY
PROPOSED ACTION

	Industrial Sectors									
	Agriculture	Mining	Construction	Manufacturing	Transportation and Communication	Wholesale and Retail Trade	Finance, Insurance and Real Estate	Services	Government and Misc	Total a/
Existing Situation 1977-Total b/										
Income ($1,000)	716	9,826	1,230	423	2,262	2,149	D	4,908	7,783	31,174
Employment (Wy)	175	586	69	43	119	256	D	735	744	2,871
CHANGES										
Initial AUM Allocations										
Total Output ($1,000)	-347	L	-3	-1	-10	-11	-7	-6	0	-384
Income ($1,000)	-140	L	-1	L	-3	-4	-1	-2	-33	-155
Employment (Wy)	-50	L	-0.1	L	-0.2	-0.4	-0.1	-0.2	-0.3	-6.4
Implementation Assumptions										
Total Output ($1,000)	1,157	-1	-10	-2	-33	-36	-22	-20	0	-1,282
Income ($1,000)	-467	L	-3	L	-10	-13	-4	-7	-11	-515
Employment (Wy)	-129	L	-0.2	L	-0.7	-1.3	-0.3	-0.8	-0.8	-21.2
Short-Term										
Total Output ($1,000)	-346	-12	33	7	7	53	4	28	0	-216
Income (1,000)	-140	L	10	1	1	20	1	10	123	26
Employment (Wy)	-50	L	0.7	0.1	0.1	2.8	0.1	1.2	10.2	10.2
Long-Term c/										
Total Output (1,000)	1,141	2	33	7	56	115	47	67	0	1,450
Income (1,000)	461	L	10	1	14	36	8	24	143	697
Employment (Wy)	16.7	L	0.7	0.1	1.0	3.6	0.7	2.9	11.1	37.8

a/ Detail may not add due to rounding

b/ Industrial categories are not exactly comparable to categories in computer runs.

c/ Increases in sheep AUMs were not included (see Appendix K).

Note: D-Withheld to avoid disclosure of confidential sources.
L-Less than $1,000 or 0.1 work year.
Wy-Work year, defined as 2,000 work hours.

Source: U.S. Department of Agriculture, Forest Service. Intermountain Region, Ogden, Utah Nevada Input/Output Model 04m-EA, Computer Printout, January, 1980.

In the long run an additional $1,450,000 in total output would be generated as a result of increases in AUMs and increases in hunter expenditures. This translates into an additional $697,000 in income, an increase of two percent over 1977 levels. Additional employment would be 38 work years by the year 2015. Agriculture is the primary sector impacted.

County Taxes and Revenues

Tax revenues from agriculture have been declining in Nye County. The ranches in the resource area represent only two percent of county "assessed valuation" (Chapter 2, Social-Economics Values). Changes in the tax base as a result of the proposed action would occur as a result of changes in livestock, in ranch agricultural land, and in urban development.

Tax revenue from livestock held for inventory purposes will be eliminated by 1983. However, as a result of the proposed action, livestock numbers might be reduced. If livestock were reduced in 1981 or 1982 a small (less than one percent) reduction in county taxes would occur. If all livestock reductions were made in 1983 no impact would occur.

Tax on agricultural land is based on a fixed value by use category. If ranchers sell and move out of the area, base property may be reduced in value, i.e., land may go from irrigated pasture to range. On the other hand, ranchers or other farmers may elect to grow more feed as a result of periods-of-use changes. This would increase assessed valuation.

Changes in Nye County as a result of the increased mining and the proposed MX missile system would create a demand for present agricultural land to be converted to more urban land uses. As a result of the proposed action, some ranchers may view this option more favorably. Because of the fixed agricultural assessment, as opposed to the market value urban assessment, movement of this type would create more tax revenues. However, a widely scattered urban population would cost the county considerably more than a concentrated one. Overall the revenue structure of Nye County should remain strong and the proposed action should have minor impacts.

Conclusion

In the short-term, the cumulative effects of the proposed action might force some ranchers to buy hay, truck their cattle outside of the area, or go out of the livestock business. As a consequence, some ranchers might have to seek full-time, off-ranch employment to sustain their ranching operation at current levels. However, full-time, off-ranch employment opportunities within reasonable commuting distance are extremely limited. Thus, these ranchers might either have to reduce the size of their operation or perhaps go out of business. Should this occur, ranching community young adults would probably elect to seek their social and economic opportunities elsewhere depriving the ranching community of resident ranch heirs. Both locally and regionally, this would probably further alienate many residents to the point where the implementation of future federal land management programs in the resource area would meet a higher degree of resistance. Should ranchers elect to liquidate their resource area ranching assets, it is very likely that corporate ranching operations would expand in the area. In time, this could change the social and political structure of the area with absentee, corporate land-owners replacing the ranching family as owner-operator of area ranches. For those ranchers who continue in business in the long-term, many of these adverse effects would tend to reverse.

In the short-term, net ranch income would decline by $727,500 based on period-of-use impacts. Periods-of-use impacts have far greater economic consequences than the proposed AUM reductions for all but a few ranchers. Implementation assumptions could result in a further decline in rancher income of $131,000. In the long-term, rancher income would increase by $210,000 over base levels. Rancher wealth would increase by $.5 million.

Wildlife increases, while being supported by wildlife enthusiasts, might be the source of potential conflicts if those increases draw an influx of out-of-area hunters who displace local hunters from their favorite hunting areas. Reduction of wild horse numbers by 73 percent and relocating those reduced numbers in a lesser number of wild horse use areas may well become a potential source of conflict between BLM and those who would prefer to see greater numbers of these free roaming horses in a greater number of use areas. Long-term increases in wild horse numbers may tend to dispel some of the concerns of those who have opposed any reduction in wild horse numbers.

Implementation of the proposed action would tend to sustain and perhaps intensify the feeling of alienation from and distrust of the federal government by ranching community members.

The decline in rancher wealth would be $1.2 million. In the long-term, rancher income would increase by $209,007 over base levels. Rancher wealth would increase by $.5 million.

Immediate declines in regional output would be $384,000. Short-term declines in regional output would be $216,000. However, income would increase by $26,000 and work years would increase by ten as a result of changes in government and hunting expenditures. In the long-term, regional output increases $1,450,000; regional income increases $697,000; and regional employment increases 38 work years over base levels.

UNAVOIDABLE ADVERSE IMPACTS

Short term losses in ranch income would be $727,500 and losses in rancher wealth would be $1.2 million. An additional $131,000 would be lost under the implementation assumptions. The losses might force a few of the ranchers to sell their ranches or to seek part-time off-ranch employment in order to survive.

NO ACTION ALTERNATIVE

IMPACTS

No economic impact to the cattle ranchers would occur under this alternative. Trends already present, e.g., growth of large agribusiness ranches, would be expected to continue. The short- and long-term ranch budgets would be the same as the base budgets (Table 3-16). Interaction with regional communities would continue at present levels and no changes would occur (Table 3-18).

After months of speculation in the resource area concerning the magnitude of the AUM reductions that would ultimately be proposed, the implementation of a No Action alternative would probably be received with a general sense of relief throughout the region. There might be some concern expressed by the ranchers, however, that range improvements would be held in abeyance. Implementation of this alternative would probably tend to confirm the belief that the public domain can support the present type of ranching operation without subsequent damage to the land or its resources. Under this alternative, the regional lifestyles would continue much as they have in the past.

UNAVOIDABLE ADVERSE IMPACTS

Suspicion and distrust of the federal government would continue. A feeling of uncertainty about the thrust and direction of future federal land management decisions would continue to exist.

NO LIVESTOCK GRAZING ALTERNATIVE IMPACTS

The elimination of all livestock grazing on public lands in the resource area would have serious economic consequences for all resource area ranchers who are primarily based in the resource area. Because of the heavy dependency of many of the ranchers on public land forage in the resource area, alternatives are extremely limited. Those ranchers who have all of their grazing in the area and have limited base property would be forced to reduce their herds to a size that could be maintained on base property or be forced out of the livestock business. Those ranchers who have large amounts of grazing outside the area could continue in the livestock business outside the area. Table 3-19 shows economic losses by size category.

Typical small ranches do not have feed resources to maintain even reduced herds under this alternative. If hay is purchased, net ranch income is negative. It is probable that many small ranch operations would be forced out of the livestock business. Income loss ranges from $4,600 to $11,000 based on herd reduction or purchased hay. Medium ranches have the lowest dependency on the resource area forage and could continue ranching outside the area at reduced income levels. Typical large ranches have a positive net ranch income if hay is purchased. However, their net income would be reduced by $217,000 to $48,900. Return to investment would be reduced to two percent. Large ranches with higher dependencies on resource area feed than the typical ranch would have income losses higher than this and net income may be negative. Even if the returns are positive, ranchers who view ranching as a business rather than a lifestyle might leave the area to seek more profitable investment opportunities.

Active sheep operators would also be severely impacted because elimination of all livestock grazing would deprive those operators of access to historic trail patterns in the area. This could force those operators out of business if alternate trailing arrangements could not be accomplished. Economic losses to sheep operations based on hay feeding would be $42,240 (2,816 AUMs x 1 ton per 4 AUMs x $60 per ton).

Although the Bureau of Land Management does not recognize a capitalized value for grazing preferences they do contribute to the capital position (wealth) of the ranchers. The wealth of the ranchers would decline as a result of the elimination of grazing privileges on BLM lands. The loss would be $7.2 million (150,320 AUMs X $50 per AUM) figured on the basis of grazing preference. Actual

TABLE 3-18
ECONOMIC IMPACTS ON NYE COUNTY
NO ACTION-NO LIVESTOCK GRAZING-LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES

	Agriculture	Mining	Construction	Manufacturing	Transportation and Communication	Wholesale and Retail Trade	Finance, Insurance and Real Estate	Services	Government and Misc	Total a/
No Action (Existing Situation 1972)										
Income ($1,000)	716	9,826	1,230	423	2,262	2,149	D	4908	7,783	31,174
Employment (WY b/)	175	586	69	43	119	256	D	735	744	2,871
Changes from Existing Situation										
No Livestock Grazing Initial AUMs Allocations										
Total Output ($1,000)	-5,014	-4	-45	-8	-143	-155	-95	-88	0	-5,553
Income ($1,000)	-2,025	-1	-13	-2	-42	-55	-16	-31	-47	-2,232
Employment (WY)	-73.3	-L	-0.9	-0.1	-3.0	-5.8	-1.5	-3.5	-3.7	-91.8
Short-Term Impacts										
Total Output (1,000)	-5,013	-4	-45	-8	-142	-143	-94	-80	0	-5,530
Income ($1,000)	-2,025	-1	-13	-2	-42	-50	-15	-28	-46	-2,224
Employment (WY)	-73.3	-L	-0.9	-0.1	-3.0	-5.1	-1.5	-3.1	-3.6	-90.6
Long-Term Impacts										
Total Output ($1,000)	-5,013	-4	-44	-8	-141	-128	-93	-69	0	-5,501
Income ($1,000)	-2,025	-1	-13	-2	-42	-45	-15	-25	-46	-2,213
Employment (WY)	-733	-L	-0.9	-0.1	-2.9	-4.2	-1.5	-2.5	-3.5	-90.0
Livestock Reduction/ Maximizing Wild Horses Initial AUM Allocation										
Total Output ($1,000)	-3,099	-2	-28	-5	-89	-96	-59	-55	0	-3,432
Income ($1,000)	-1,252	-L	-8	-1	-26	-34	-10	-19	-29	-1,380
Employment (WY)	-453	-L	-0.5	-0.1	-1.8	-3.6	-0.9	-2.2	-2.3	-567
Short-Term										
Total Output ($1,000)	-3,099	3	4	-2	-82	-64	-55	-38	0	-3,329
Income ($1,000)	-1,259	L	1	L	-24	-22	-9	-14	38	-1,289
Employment (WY)	-453	L	0.1	L	-1.7	-2.0	-0.9	-1.4	2.9	-483
Long-Term c/										
Total Output ($1,000)	-2,703	3	4	-2	-73	-42	-48	-24	0	-2,886
Income ($1,000)	-1,092	L	1	L	-22	-14	-8	-9	41	-1,149
Employment (WY)	-39.5	L	0.1	L	-1.5	-0.8	-0.8	-0.7	3.2	-40.0

a/ Detail may not add due to rounding.

b/ Industrial categories are not exactly comparable to categories in computer runs.

c/ Increases in sheep AUMs were not included (See Appendix K).

Note: D-Withheld to avoid disclosure of confidential sources.
L-Less than $100 or 0.1 work years.
WY-Work Year, defined as 2,000 work hours.

Source: U.S. Department of Agriculture, Forest Service. Intermountain Region, Ogden, Utah Nevada Input/Output Model 04m-EA, Computer Printout, January, 1980.

TABLE 3-19
ECONOMIC IMPACTS TO LIVESTOCK RANCHERS
NO ACTION-NO LIVESTOCK GRAZING-LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES

	No Action Alternative	No Livestock Grazing Alternative		Livestock Reduction/Maximizing Wild Horses Alternative			
				Initial AUM Allocation		Future AUM Allocation	
						(Decrease)	(Increase)
		Hay Purchase	No Hay Purchase	Hay Purchase	No Hay Purchase	Hay Purchase	No Hay Purchase
Cattle							
Small--							
Number Operators Impacted	6	3	3	3	3	3	2
Average AUM Change		-1,191	-1,191	-552	-552	-461	+173
Total Gross Income	26,874	11,361	(No feed	26,874	13,327	26,874	28,894
Cash Costs	9,250	10,688	source)	18,993	6,679	17,633	9,613
Operator and family labor	7,448	3,149		8,332	5,002	8,235	8,385
Returns above cash costs and family labor	10,176	(Negative)		(Negative)	1,646	1,006	10,896
Net ranch income	6,812	(Negative)		(Negative)	(Negative)	(Negative)	7,531
Remaining Change a/		-930	-930	-180	-180	-180	0
Medium--							
Number Operators Impacted	4	3	3	2	2	2	1
Average AUM Change		-750	-750	-456	-456	-456	+255
Total Gross Income	69,479	69,479	53,458	69,479	59,727	69,479	70,383
Cash Costs	35,272	45,321	24,065	41,298	28,324	41,298	35,593
Operator and family labor	10,000	10,506	10,000	10,091	10,126	10,091	10,000
Returns above cash costs and family labor	24,207	13,652	19,393	18,090	21,277	18,090	24,790
Net ranch income	19,369	8,814	14,746	13,252	16,439	13,252	19,379
Remaining Change a/		-980	-980	-980	-980	-980	0
Large--							
Number Operators Impacted	8	8	8	6	6	6	2
Average AUM Change		-15,298	-15,298	-12,349	-12,349	-11,987	+3,375
Total Gross Income	436,122	401,432	64,778	392,468	111,418	394,084	484,912
Cash Costs	138,831	319,790	71,405	299,998	70,801	294,031	145,003
Operator and family labor	16,837	18,700	16,837	19,472	16,837	19,375	16,891
Returns above cash costs and family labor	280,454	62,942	(Negative)	72,998	237,780	80,678	323,018
Net ranch income	266,394	48,882	(Negative)	58,938	9,720	66,618	308,865
Remaining Change a/		0	0	0	0	0	0
Sheep--							
Number Operators Impacted	8	4	0	0	0	0	8
Average AUM Change		-704	-704				+967
Economic costs based on hay feeding b/		$10,560	-10,560				$9,670
Total Changes in Net Ranch Income c/		-$1,804,700	-$2,177,900	-$1,278,600	-$1,567,500	-$1,145,900 d/	

a/ AUM changes of less than one percent in total feed sources were evaluated in terms of cost of substitute hay at $60 per ton.

b/ Decreases in AUMs were evaluated using costs of substitute hay, increases were evaluated using an average income change of $10 per AUM.

c/ Change in net ranch income = Sum by size category of [(existing net ranch income-changed net ranch income) x number of operators impacted] + remaining changes. Negative income evaluated at zero income.

d/ Change in ranch income is the sum of the increase and decrease columns of cattle ranchers only.

Source: Gee, Kerry. Economics, Statistics, and Cooperatives Service, Agriculture Economist, personal communication. Fort Collins, Colorado, 1980.

dollar losses associated with ranch values would not accrue to the ranchers until the preferences are leased, sold, transferred, or used as collateral for loans.

Market prices for ranches in the resource area are related to the relative mix of public lands of which a ranch is composed and any withdrawal of grazing privileges on public lands from that mix can have immediate and serious implications for both the ranching community and the financial institutions that stand behind that community. If, as a result of implementing the No Livestock Grazing alternative, ranchers elect to sell ranch lands, they would probably realize less income from the sale of the base property than would have been the case if the ranch had been sold with the attached grazing privileges.

The loss in wealth attached to grazing privileges would also impact those ranchers who elected to stay and ranch on base property. The loss in wealth would make borrowing the necessary capital to alter the operation more difficult.

Trends and impacts described under the proposed action would be intensified and accelerated by the No Livestock Grazing alternative. Ranching community young adults would probably elect to leave the area to seek their social and economic opportunities elsewhere, thus displacing resident heirs from the ranching operation. Tight, closeknit family relationships would give way to geographically separated, isolated family units. The demise of the small, family owned ranch would probably be accelerated.

An unquantified impact of the No Livestock Grazing alternative is its contribution to an existing and apparently intensifying feeling of alienation from and distrust of the federal government. For those ranchers who felt that they were being forced out of the cattle business as a direct result of implementing the No Livestock Grazing alternative, the feeling would intensify. A personal sense of failure might evolve for those ranchers who felt they were "forced to sell." As one rancher stated, "... This ranch has been in the family for many decades and I don't want to be remembered as the guy who lost the family homestead."

Ranch hands and their families would be displaced under a No Livestock Grazing alternative. Many of these ranch employees main marketable skills are agriculturally related-skills which would no longer be in demand in the resource area agricultural community if the No Livestock Grazing alternative were implemented. However, should mining or other related activity expand in the area, the possibility exists that some of these individuals would be absorbed into that labor force. Others, however, may elect to leave the area to seek agricultural employment elsewhere.

Ranchers could be expected to actively oppose the allocation of all resource area AUMs to wildlife and wild horses while denying any AUM allocations to livestock. The No Livestock Grazing alternative would be particularly reprehensible for those ranchers who have, over the years, expended their own financial assets to develop additional waters on public lands in order to expand their livestock operation. To deny livestock grazing in these areas while permitting wildlife and wild horses to graze and use water could be expected to arouse and sustain a great deal of anger and hostility directed toward the Bureau of Land Management. Those wildlife and wild horse protectionists who favor balanced use of public domain could be expected to oppose the implementation of this alternative.

Short run increases in hunting would be the same as for the proposed action. In the long run the increases in the big game population would result in an additional 2,397 hunter days. Additional expenditures of $42,150 would result in additional income of $18,770 and additional employment of 3.1 work years. An additional $197,470 in value would occur to those who hunted in the area (Appendix K).

INDIRECT IMPACTS

Regional output would be initially reduced by $5,553,000. Losses in income and employment represents a decline of seven percent of total regional income and two percent of total regional employment. In the short-term, increases in hunting would slightly mitigate these losses. In the long run increases in hunting would result in an additional output of $52,000 over the 1981 levels. Total output would still be reduced by seven percent over the 1977 levels (Table 3-18).

Base property could go out of agricultural production under this alternative. This would result in a loss of property tax revenue to the county. Loss in tax revenue from reductions in livestock would occur only if livestock reductions were made before 1983.

Ranchers might sell their property to more urban development. This would most likely occur around Tonopah or some of the mining developments. Although conversion from agriculture to alternative developments could increase tax revenues, scattered developments could cost the county more than the increased revenue.

Conclusion

Trends and impacts described under the proposed action would be accelerated. Resident ranch heirs would probably leave to seek their social and economic opportunities elsewhere, hastening the demise of the small, family-owned ranch. Ranch hands and their families would either leave the area in pursuit of ranch related employment or attempt to be absorbed into the non-agricultural local labor market. Ranchers would be further alienated from the federal government and some regional residents would blame the federal government for forcing some of their ranching friends out of business. Some loss of self-esteem and self worth would probably be experienced by those ranchers who are generationally linked to their ranching properties and who felt forced to sell those properties if the No Livestock Grazing alternative were implemented. Should these families elect to leave the area and relocate in an urban area, a dramatic change in life styles would occur, accompanied, no doubt, by conflicting changes in values and attitudes.

Most of the ranchers would be forced out of business under this alternative. The decline in wealth of ranchers would be $7.2 million.

In the short-term regional output loss would be $5,550,000 resulting in an income loss of $2,224,000, a decline of seven percent over the 1977 base level. Ninety-one work years of employment would also be lost.

In the long-term, additional hunting would create $19,000 of regional income. This would still be a loss of $2,213,000 over base levels.

UNAVOIDABLE ADVERSE IMPACTS

Most ranchers would be forced out of the livestock business. Land would go from agriculture to nonuse. Rancher wealth would decline by $7.2 million.

Regional income loss would be $2,224,000 in the short-term and $2,213,000 in the long-term. Employment would decline by 91 work years in both the short-term and 90 work years in the long-term. Those who sold ranch properties would be forced into what they consider to be less desirable alternative lifestyles.

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

IMPACTS

If this alternative were implemented, all of the operators would initially be allocated fewer AUMs than is currently authorized. Fourteen of the ranchers would have less AUMs permitted than their five year average use with four ranchers not being permitted to graze under this alternative. By the year 2015, 9,760 additional AUMs would be allocated for livestock grazing. However, the 2015 level still represents a 50 percent cut from the five year average use (Table 3-15).

Table 3-19 shows economic losses in income occurring from this alternative. There is a high probability that the reductions proposed in this alternative would force some ranchers out of the livestock business because they would be reduced to a scale of operations that is not economically viable.

Should this occur, the sale of ranches to corporate interests would probably be accelerated, thus hastening the demise of the family owned and operated ranch. In the long term, this could significantly alter the social composition of the ranching community. Absentee, corporate owners with resident ranch managers may well replace, in many cases, the traditional ranching family as owner-operator of some resource area ranchers. Although BLM does not recognize a capital value for grazing preferences, the preferences do contribute to the capital position (wealth) of the ranchers to whom they are alloted.

The loss in wealth figured from an preference base would be $5.0 million (150,320 AUMs-49,965 AUMs) X $50 per AUM in the short-term and $4.5 million in the long-term) (150,320 AUMs-59,725 AUMs x $50 per AUM). Actual dollar losses would not accrue to the ranchers until the preferences are leased, sold, transfered, or used as collateral for a loan.

Dollar losses to the rancher might be higher than the above figures indicate. The value of the base property is tied to its value as a viable ranch. If ranchers feel they are forced to sell their ranches as a direct result of implementing this alternative, the loss in grazing preferences would also lower the value of the base property. Ranchers who stay might have trouble obtaining the loans for altering their operations which would be necessary under this proposal because of the change in their wealth position.

Maximizing wild horses would be received negatively by members of the ranching community who

feel that large herds of uncontrolled wild horses do irreparable damage to the public lands. Ranchers could be expected to react to the elimination of such a large portion of livestock grazing in favor of wild horses and wildlife with outrage. Some wild horse protectionists could be expected to view the implementation of this alternative positively. However, those wild horse protectionists who favor balanced use of the public domain would oppose implementation of this alternative.

Many ranching community young adults would probably leave to seek their opportunities elsewhere. Tight, family relationships would give way to geographically separated, isolated family units. Trends and impacts described under the proposed action would be intensified and accelerated by the implementation of this alternative.

INDIRECT IMPACTS

Initially, total output would decline by $3,432,000 as a result of the reduction of 76,750 AUMs. Agriculture would be the primary sector impacted with reduced output of $3,099,000. Regional income would decline by $1,380,000 a four percent decline over 1977 levels (Table 3-19).

In the short-term, hunting expenditures could increase by $18,810.

To implement this proposal the Tonopah BLM Office could hire an additional five persons. Additional maintenance expenditures are estimated to be $19,000 annually.

Total short-term output changes would still represent a loss of $3,329,000. Income losses would be $1,289,000, a decline of four percent over 1977 levels.

In the long-term, the additional hunting expenditures and AUM increases would result in total output gains of $546,000 over the total 1981 level. However, this still represents a decline of four percent over the 1977 base level. Lodging, recreation, services, construction, and mining show slight gains under this alternative.

Conclusion

Sale of family owned ranches would probably be accelerated which would alter, in the long-term, the social and political structure of the ranching community. Maximizing wild horses would be received negatively by many regional residents. Ranching community young adults would probably leave to seek their opportunities elsewhere.

Many of the ranchers would be forced out of business. In the short-term those who remained in business would have income losses of over $1.3 million from base levels. Short-term decline in rancher wealth would be $5.0 million. In the long-term 12 ranchers would still have income losses of $1.2 million and five would have income gains of $0.1 million. The long-term decline in wealth would be $4.5 million.

Short-term regional income loss would be $3,329,000. Short-term employment would decline 48 work years and income would decline $1,289,000. Even with increases in AUMs and big game hunting, long-term output would decline by $2,886,000 with resulting declines in income of $1,149,000 and employment of 40 work years.

Changes in the tax structure could occur as a result of this alternative. Some ranchers who are significantly reduced may choose to sell off their base property to urban types of development associated with the increased mining activity or the MX missile project. Although this may increase the tax base it could well cost more in terms of services than the increased revenues. Ranchers in more remote areas of the resource area may not have an opportunity to sell, and assessed agriculture value may decline.

UNAVOIDABLE ADVERSE IMPACTS

A great deal of vocal anger and hostility would be generated by implementation of this alternative. The ranching community would be further alienated from and distrustful of the BLM federal land management process.

Many of the ranchers would be forced out of business. Short-term rancher income loss would be over $1.3 million while long-term rancher income loss would be over $1.1 million. Rancher wealth would decline $5.0 million in the short-term and $4.5 million in the long-term.

Regional income loss would be $1,289,000 in the short-term and $1,149,000 in the long-term. Loss in employment would be 48 and 40 work years in the short- and long-term.

CHAPTER 4

LIST OF PREPARERS

CHAPTER 4

LIST OF PREPARERS

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Calvin R. McKinlay, District Soil Scientist. B.S. Agronomy, Utah State University at Logan. Contributed to "Soils."

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Mark E. O'Brien, Range Conservationist and Watershed Specialist. B.S. Range Management, B.S. Wildlife Management, Humboldt State University. Responsible for "Soils," "Water," and "Climate."

James R. Orwin, Range Conservationist. B.S. Forest Recreation including 34 quarter hours in Range Management, Utah State University at Logan. Responsible for "Vegetation" and "Livestock Grazing."

Neil D. Talbot, Team Leader. B.S. Range Management, Utah State University at Logan. Overall responsibility for preparation of the EIS.

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CHAPTER 5

PUBLIC PARTICIPATION

CHAPTER 5

PUBLIC PARTICIPATION

CONSULTATION AND COORDINATION

The preparation of the Tonopah Grazing Environmental Impact Statement (EIS) was announced in a news release dated October 1978. A news release issued in May of 1979 discussed the proposal in greater depth and also listed the names and telephone numbers of those who could give interested persons more information. A notice of intent to write the EIS was published in the *Federal Register* of May 21, 1979.

During the preparation of the Draft Environmental Impact Statement (DEIS) the team was in contact with other federal offices, state and local agencies, interested groups, and individuals. Communications varied from formal written correspondence to informal personal contact and telephone calls. Information concerning the proposed action and the Bureau of Land Management's (BLM) preparation of this document was and will be covered in local, regional, and statewide media.

During June, July, and August 1978, all 26 operators with grazing privileges in the Tonopah Resource Area were contacted in an attempt to discuss social values, attitudes, and economic perspectives regarding ranching and grazing on public lands. In addition three permittees who lease their grazing privileges to three of the 26 operators were also contacted (Appendix K).

The Economics, Statistics, and Cooperatives Service (ESCS) under contract to the Bureau of Land Management held a rancher producer panel meeting in Tonopah on October 23, 1979. This meeting was used to verify and update ranch budgets developed by ESCS. These budgets form the basis for the economic analysis of the impacts on ranch operators.

SCOPING PROCESS

Through the scoping process conducted over a five-week period, May 21 to June 27, 1979, the Battle Mountain District of the Bureau of Land Management contacted interested individuals, groups, and other agencies concerning the preparation of the Tonopah Grazing Environmental Impact Statement. Letters of invitation were sent to individuals, groups, and agencies. Two news releases were issued to the local and state news media soliciting public input.

Representatives from the Battle Mountain District Office of the BLM discussed the ramifications of the EIS in a meeting with the Nevada State Clearinghouse on June 13, 1979. Four informal meetings in June 1979 were held with wild horse, livestock, and Congressional field representatives. Written comments were received from the State Clearinghouse. No written comments were received as a result of the other meetings. A follow-up news release was issued June 22, 1979, concerning the EIS preparation process and public contacts.

Representatives of BLM met with Nevada Cattlemen's Association representatives to discuss the economic analysis within the Tonopah EIS. Some ranchers agreed to help construct ranch budgets which are used within the EIS.

INTERAGENCY CONTACTS

Professional contacts have been made with the Nevada Department of Wildlife (NDW), Fish and Wildlife Service (F&WS), Soil Conservation Service (SCS), and Forest Service (FS).

Informal consultation on the possible existence of threatened or endangered plants is scheduled for May 1980 with U.S. Department of the Interior, Fish and Wildlife Service.

Consultation has begun with the Nevada State Historic Preservation Officer.

AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE DRAFT EIS WILL BE SENT

CONGRESSIONAL

Senator Howard Cannon
Senator Paul Laxalt
Congressman James Santini

FEDERAL AGENCIES

Advisory Council on Historic Preservation

Department of Agriculture

- Forest Service
- Soil Conservation Service

Department of Defense

Department of the Air Force

Department of Energy

Department of the Interior

Bureau of Indian Affairs

Bureau of Mines

Water and Power Resources Service

Geological Survey

Environmental Protection Agency

Fish and Wildlife Service

Heritage Conservation and Recreation Service

STATE AGENCIES

Office of the Governor, Nevada

Nevada State Planning Coordinator

Nevada State Clearinghouse-25 copies-distributes copies to State Agencies

Nevada Department of Wildlife

Legislative Counsel Bureau

LOCAL AGENCIES

Gabbs Mayor

Nye County Commissioners

Nye County Planning Commission

UNIVERSITY OF NEVADA

Max C. Fleischmann College of Agriculture

Division of Agricultural and Resource Economics

Division of Animal Science

Division of Renewable Natural Resources

Nye County Extension Agent

Desert Research Institute, Las Vegas and Reno

Mackay School of Mines

Nevada Bureau of Mines and Geology

NEVADA STATE LEGISLATORS

Richard E. Blakemore

Jack F. Fielding

OTHERS

Ada County Fish and Game League, Idaho

American Fisheries Society

American Horse Protection Association, Inc.

Audubon Society, Lahontan Chapter

Desert Bighorn Council

Foresta Institute

Friends of Nevada Wilderness

Friends of the Earth

Grazing permit holders within Tonopah Resource Area

National Council of Public Land Users, Colorado

Natural Resources Defense Council

Nevada Cattlemen's Association

Nevada Outdoor Recreation Association/National Public Lands Task Force

Nevada Woolgrower's Association

Northern Nevada Native Plant Society

Oregon Environmental Council

Pacific Legal Foundation

Private citizens who have requested a copy of the DEIS

Public Lands Council

Sage County Alliance for a Good Environment

Society of Range Management

Toiyabe Chapter of the Sierra Club

Wilderness Society

Wild Horse Organized Assistance

Wildlife Management Institute

AVAILABLILITY OF DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Draft Environmental Impact Statement (DEIS) will be sent to everyone who requests a copy and their substantive comments will be treated in a comments and responses section of the FEIS. Others identified in the Preparation Plan for this EIS will be sent letters of notification regarding availability of the Draft and Hearings. A news release will be issued statewide concerning availability of the EIS.

Copies of the DEIS and FEIS will be available at all BLM District and State Offices including the following locations:

BUREAU OF LAND MANAGEMENT OFFICES

Office of Public Affairs, BLM
18th and C Streets
Washington, D.C. 20240

Nevada State Office
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

Battle Mountain District Office
North 2nd and South Scott Streets
Battle Mountain, Nevada 89820

Carson City District Office
1050 E. Williams Street
Carson City, Nevada 89701

Elko District Office
2002 Idaho Street
Elko, Nevada 89801

Ely District Office
Star Route 5, Box 1
Ely, Nevada 89301

Las Vegas District Office
4765 West Vegas Drive
Las Vegas, Nevada 89102

Winnemucca District Office
705 East 4th Street
Winnemucca, Nevada 89445

PUBLIC LIBRARIES

Churchill Public Library
553 South Main Street
Fallon, Nevada 89406

Clark County Library
1401 East Flamingo Road
Las Vegas, Nevada 89121

Elko County Library
Elko, Nevada 89801

Esmeralda County Library
Goldfield, Nevada 89013

Eureka County Library
Eureka, Nevada 89316

Lander County Library
Battle Mountain, Nevada 89820

Mineral County Library
1st and D Streets
Hawthorne, Nevada 89415

Nevada State Library
Library Building
Carson City, Nevada 89710

Nye County Library
Tonopah, Nevada 89049

University of Nevada, Las Vegas
James R. Dickinson Library
4505 Maryland Parkway
Las Vegas, Nevada 89154

University of Nevada, Reno
Getchall Library
Reno, Nevada 89507

Washoe County Library
301 S. Center Street
Reno, Nevada 89505

White Pine County Library
City Hall
Ely, Nevada 89301

HEARINGS

Public Hearings will be held on this Draft Environmental Impact Statement. Notice for dates and times for public hearing will be announced in advance to the public news media and in the *Federal Register*.

APPENDICES

APPENDIX A

VEGETATION PRODUCTION AND ALLOCATION

SECTION 1

METHODOLOGY FOR DETERMINING VEGETATION PRODUCTION AND ALLOCATION FOR THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

SECTION 2

METHODOLOGY FOR ESTIMATING AUMS AFTER VEGETATIVE MANIPULATIONS

SECTION 3

METHODOLOGY FOR CALCULATING REASONABLE AND EXISTING NUMBERS OF BIG GAME BY ALLOTMENT

SECTION 4

METHODOLOGY FOR COMPUTING HUNTER DAYS

APPENDIX A

Section 1

METHODOLOGY FOR DETERMINING VEGETATION PRODUCTION AND ALLOCATIONS FOR THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

TONOPAH RESOURCE AREA

VEGETATION ALLOCATION PROCEDURES--1979

The Tonopah vegetation allocation program is based on an ocular reconnaissance range survey that was completed on the Tonopah Resource Area between the summers of 1959 and 1964 as per BLM Manual 4412.11A.

The following rangeland suitability criteria was applied for vegetation allocations in the Tonopah Resource Area (refer to Table A-1 for suitability acreage by allotments):

1) No vegetation four miles or greater from water was allocated to livestock or wild horses.

2) No vegetation on slopes of 50 percent or greater was allocated to livestock or wild horses.

3) No vegetation was allocated to livestock or wild horses in areas with critical erosion condition of 60 (SSF) or greater.

The Nevada State Office (NSO) Cartography Section prepared 1"/mile 30-minute quadrangles (base maps) showing land status, allotment lines, and range survey write-up areas (vegetative types). They then used an electronic planimeter and computed an acreage figure for each section, township, and quadrangle. Overlays were constructed for each 30-minute quadrangle depicting each of the rangeland suitability criteria used in the Tonopah Resource Area. Slope in excess of 50 percent, erosion classes with ratings of 60 SSF or greater, and areas greater than four miles from water were determined and shown on 30-minute quadrangle maps. Battle Mountain District personnel determined acreages for the above suitability criteria and vegetative types by section on 30-minute quadrangles and overlays.

Proper Use Factors (PUFs) and Forage Acre Requirements (FARs) were established for the 1959 to 1964 range survey and remained unchanged for the vegetation allocation in 1979.

A review of all the original 1964 range survey sheets was conducted to check for errors in the calculated acres/AUM using the following formula: Av (cattle) PUF x Av Density = FAF x % Utilization = Net FAF; FAR divided by Net FAF = Ac/AUM. The acres/AUM were then transferred to the appropriate allotment's sheet and specific vegetative type for use in allocating vegetation (Refer to "Forage Allocation Procedures" manuscript on file in the Tonopah Resource Area for more specific discussion.) The above information was transferred to the appropriate columns on the Range Summary/Forage Allocation Summary (Form N6-4412-3).

Livestock Animal Unit Months (AUMs) were then computed and recorded on the Range Survey/Forage Allocation Summary sheet. The acreages recorded for each category of the suitability criteria (slope, slope/water, SSF, SSF/water, water) were divided by the acres/AUM figure from the original range survey write-up for that particular vegetative type. The AUMs calculated for rangeland suitability criteria are presently unavailable for livestock use. The remaining acres divided by the acres/AUM figure for that vegetative type gives the AUMs available for livestock and wild horse use (Refer to Vegetation Allocation Procedures Manuscript, 1976, located at the Tonopah Resource Area Office).

Examples of the calculations are shown below:

Example 1

Av (cattle) PUF .300 x AV Den .44 = FAF .132 x 100% Util = Net FAF .132; FAR .8 divided by Net FAF .132 = 6 Ac/AUM.

Allotment	: Blue Eagle
Vegetation type	: 1 (grass) SPAI (*Sporobolis airoides*)
Total acres in vegetation type	: 465
Total usable acres	: 465
Total unsuitable acres	: 0
Acres/AUM	: 6.0

465 acres divided by 6.0 acres/AUM = 77.5 AUMs produced on the usable acres.

Appendix A
Section 1
TABLE A-1
GRAZING SUITABILITY
(ACRES) a/

	Unsuitable b/	%	Potentially Suitable c/	%	Suitable	%	Total
Blue Eagle	7,456	16	0	0	38,043	84	45,499
Butterfield	33,107	27	332	1	88,641	72	122,080
Crater Black Rock	16,247	17	2,863	3	78,749	80	97,859
Currant Ranch	677	6	0	0	10,483	94	11,160
Forest Moon	638	9	0	0	6,241	91	6,879
Francisco	0	0	0	0	16,896	100	16,896
Hot Creek	38,857	20	679	1	149,971	79	189,507
Hunts Canyon	2,864	3	2,585	3	84,234	94	89,683
Ione	854	1	41,655	22	146,590	77	189,099
Monitor	235	1	4,135	4	91,968	95	96,338
Morey	18,537	16	1,889	2	98,183	82	118,609
Nyala	38,108	12	2,974	1	280,192	87	321,274
Ralston	13,256	4	37,703	10	317,723	86	368,682
Reveille	71,834	11	26,820	4	558,866	85	657,520
San Antone	13,155	3	127,934	29	299,737	68	440,826
Sand Springs	19,151	10	33,164	16	151,553	74	203,868
Smoky	606	1	487	1	125,883	98	126 976
Stone Cabin	44,390	11	6,457	2	346,204	87	397,051
Wagon Johnnie	6,150	6	2,757	3	95,327	91	104,236
Willow Creek	116	1	0	0	12,575	99	12,691
TOTALS	326,238	9	292,434	8	2,998,059	83	3,616,733

a/ Applies only to livestock and wild horses.

b/ Includes acres which are unsuitable due to slope, waste types, and barren types (Appendix A, Section 1).

c/ Includes acres which are currently unsuitable due to Soil Surface Factor or lack of water.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. 1959-64 Tonopah Range Survey, 1979.

Example 2

Av (c) PUF .256 x Av Den .16 = FAF .0409 x 100% Util = Net FAF .0409; FAR .8 divided by Net FAF .0409 = 20 Ac/AUM.

Allotment	:	Butterfield
Vegetation type	:	4 (shrub) ARNO (*Artemesia nova*)
Total acres in vegetation type	:	85
Total usable acres	:	35
Unsuitable acres	:	
due to: Slope (50% or greater)	:	50
Acres/AUM	:	20

35 divided by 20 acres/AUM = 2 AUMs produced on the usable acres.

The acres and AUMs shown above are entered on the summary sheet.

Big game use areas for antelope, mule deer, and bighorn sheep were provided by the Nevada Department of Wildlife (NDW). A coordinated effort between NDW and BLM personnel was made to adjust big game use area delineations to fit existing section or vegetation type lines. A reasonable number representing an average number of animals based on population estimates over the past several years, including peak population estimates of the 1950s and the low population estimates of recent years, was assigned by NDW to each big game use area along with the periods-of-use.

Big game AUMs were determined using reasonable numbers and periods-of-use for each species. Acres per use area were calculated by totaling all the sections and vegetation types that occur within a big game use area.

When allocating vegetation to meet big game demand it was assumed that big game species are equally distributed throughout their use areas. By dividing the total acres of a use area by its total AUMs (calculated from reasonable numbers) an acre/AUM figure was determined. Big game demand for each vegetation type by section, was determined by dividing the acre/AUM figure of a use area into the acreage of the vegetation type in that section. The resultant number expresses the AUM demand occurring within that vegetation type.

PROPOSED ACTION

Initial Allocation

Outside of big game and wild horse use areas all available AUMs were allocated to livestock, however, where big game and wild horse use does occur, the use was recognized and AUMs were allocated for each use.

Example

Initial vegetation allocation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Proposed allocation (AUMs)	
livestock	1,505
mule deer	0
antelope	8
bighorn sheep	23
elk	0
wild horses	0
TOTAL	1,536

Estimated Future Production Year 2015 (AUMs)

Estimates of future production for the proposed action (that available to be allocated) come from initial allocations, potentially suitable AUMs, improvement through management, and land treatments [Tonopah Unit Resource Analysis (URA) Step 3]. It was determined (Tonopah URA) that each allotment had an improvement through management potential that vegetation could obtain over a period of time with no land treatments. Also, some allotments had potential for land treatments that would account for additional AUMs in the future.

After range suitability criteria were applied to livestock and wild horses, vegetation unallocated due to water deficiencies and SSF being 60 or greater was determined to be potentially suitable to livestock and wild horses if water was developed and erosion condition improved; the vegetation unallocated due to slope being 50 percent or greater was determined to be permanently unavailable to livestock and wild horses but was initially allocated to big game in their use areas.

Using the above criteria, the following criteria was used to determine future available vegetation under the proposed action:

Available Vegetation Production + Water Development + Erosion Condition Improvement + Improvement through Management + Land Treatments = Estimated Future Vegetation Production.

Estimated future use would be to reasonable numbers of big game where possible in their use areas. In wild horse use areas AUMs are proportionally distributed to livestock and wild horses. The remaining AUMs outside of big game and wild horse use areas would be used by livestock.

Example

Estimated future vegetation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Increase through water development	0
Improvement in erosion condition	0
Improvement through management	75
Land treatment	0
Estimated available vegetation (2015)	1,611

Estimated future use	
livestock	1,565
mule deer	0
antelope	9
bighorn sheep	37
elk	0
wild horse	0
Total	1,611

NO ACTION ALTERNATIVE

Existing Use

Under the No Action alternative, allocations to big game and to wild horses are equal to existing use for each allotment in the Tonopah Resource Area. Allocations to livestock are based on the last five year average for each allotment.

The available vegetation was determined by the 1959-64 range survey after range suitability criteria was applied to wild horses and livestock.

Example

Initial vegetation allocation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Proposed Allocations	
livestock	1,278
mule deer	0
antelope	5
bighorn sheep	26
elk	0
wild horse	0
Total vegetation used	1,318
Unused vegetation	218

Future Available Vegetation (Year 2015)

From the No Action alternative (existing use) there are a specific number of AUMs being used by livestock, big game, and wild horses for each allotment. Surplus AUMs are carried into the Underused Vegetation Column. A deficit in AUMs is shown in the Overused Vegetation Column. To determine the total future available vegetation for the year 2015 it is necessary to project the AUMs from current use to future use based on the percentage of underused or overused vegetation against the total available. To do this the following percentages were used:

Available Vegetation (1979) underused or overused vegetation (2015)	Change in available vegetation (1979) to to projected future
0 - 15 percent	No Change
16 - 45 percent	25 percent
46 - 75 percent	50 percent
75 - 100 percent	75 percent

Example

1) Estimated future vegetation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
actual use	1,318
underuse	218

Percent underused--14.2 (this percentage falls within the 0-15 percent range which means there would be no change in the future available vegetation from that of the current).

2) Estimated future vegetation (AUMs)--Crater Black Rock allotment

Available vegetation (1979)	3,476
actual use	5,291
overused	1,815

Percent overused--52.2 percent (this percentage is within the 46-75 percent range which would result in the future available vegetation being 50 percent less than the current available vegetation), or 1,738 AUMs; see Table A-2.

NO LIVESTOCK GRAZING ALTERNATIVE

Initial Allocations

The available vegetation is equal to that allocated under the proposed action.

Allocations to big game are equal to those allocated under the proposed action. Allocations to wild horses equal MFP optimum numbers. There are no allocations to livestock.

Example

Initial vegetation allocation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Proposed allocations	
mule deer	0
antelope	8
bighorn sheep	23
elk	0
wild horses	0
Total vegetation used	31
Total unused	1,505

Estimated Future Production (Year 2015)

To determine the amount of vegetation available it is assumed that potential production for an allotment would uniformly increase by 25 percent from the initial production as wild horses are reduced to optimum numbers and livestock are removed (Table A-3).

Once the total amount of vegetation to be used is determined, the next step would be to allocate the vegetation to reasonable numbers of big game and to optimum numbers of wild horses in their respective use areas. Livestock would not be allocated any vegetation in this alternative. Big game could then be allocated all the vegetation in their use areas up to the total available, but not to exceed total reasonable numbers. Wild horses would receive all the vegetation in their use areas up to the total available but not to exceed optimum numbers. Where use areas overlap, allocations would be to reasonable numbers of big game and then to optimum numbers of wild horses. Except in eight allotments (Blue Eagle, Butterfield, Currant Ranch, Forest Moon, Hot Creek, Morey, Smoky, and Stone Cabin) allocations to big game are equal to the total reasonable numbers. Allocations to wild horses would equal MFP optimum numbers in all allotments where there are wild horse areas.

Example

Estimated future vegestation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Available vegetation (2015)	1,920
Estimated future use	
livestock	0
mule deer	0
antelope	9
bighorn sheep	50
elk	0
wild horses	0
Total vegetation used	59
Total unused	1,861

LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

Initial Allocations

The available vegetation is equal to that allocated under the proposed action.

Allocations to big game are the same as under the proposed action. Allocation to wild horses are up to maximum available in their use areas. Allocations to livestock are made only in those areas outside big game and wild horse use areas.

Example

Initial vegetation allocation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Proposed allocations	
livestock	1,331
mule deer	0
antelope	8
bighorn sheep	23
elk	0
wild horses	0
Total vegetation used	1,362
Total unused	174

Estimated Future Production (Year 2015)

To determine the amount of available vegetation the following assumptions were made:

1) In big game use areas range condition would improve one condition class which would increase available vegetation by 25 percent. This is assumed because vegetation

Appendix A, Section 1, TABLE A-2
NO ACTION--FUTURE AVAILABLE VEGETATION METHODOLOGY (AUMS)

Affected Allotments	Current Available Vegetation	Percent Under Used	Percent Over Used	Future Available Vegetation
Blue Eagle	1,536	14.2	0	1,536
Butterfield	3,949	38.9	0	4,936
Crater Black Rock	3,476	0	52.2	1,738
Currant Ranch	501	25.0	0	626
Forest Moon	297	0	2.7	297
Francisco	1,114	9.5	0	1,114
Hot Creek	7,132	0	41.7	5,349
Hunts Canyon	2,984	0	31.8	2,238
Ione	10,991	51.1	0	16,487
Monitor	3,166	0	12.5	3,166
Morey	2,467	0	94.8	617
Nyala	12,343	0	15.1	12,343
Ralston	14,446	8.0	0	14,446
Reveille	30,991	0	23.5	23,243
San Antone	11,482	6.0	0	11,482
Sand Springs	9,968	38.6	0	12,460
Smoky	6,483	17.1	0	8,104
Stone Cabin	17,130	0	43.7	12,848
Wagon Johnnie	7,526	26.5	0	9,408
Willow Creek	476	3.6	0	476
TOTAL	148,458			142,914

Source: Extrapolated from Table 1-6.

TABLE A-3
NO LIVESTOCK GRAZING METHODOLOGY

Allotment	Total Allocated Vegetation a/	Estimated Future Production b/
Blue Eagle	1,536	1,920
Butterfield	3,949	4,936
Crater Black Rock	3,476	4,345
Currant Ranch	501	626
Forest Moon	297	371
Francisco	1,114	1,393
Hot Creek	7,132	8,915
Hunts Canyon	2,984	3,730
Ione	10,991	13,739
Monitor	3,166	3,958
Morey	2,467	3,084
Nyala	12,343	15,429
Ralston	14,446	18,058
Reveille	30,991	38,739
San Antone	11,482	14,353
Sand Springs	9,968	12,460
Smoky	6,483	8,104
Stone Cabin	17,130	21,413
Wagon Johnnie	7,526	9,408
Willow Creek	476	595
TOTALS	148,458	185,576

a/ The total vegetation available under the proposed action initial allocations.

b/ The uniform 25 percent increase in available vegetation by year 2015 as a result of no livestock grazing and reduction of wild horse to optimum numbers.

Source: Extrapolated from Table 1-8.

would be allocated up to reasonable numbers of big game, which would be less than total available vegetation. Livestock would not be allocated vegetation within big game use areas.

2) Outside big game use areas and within wild horse use areas estimated potential production would equal initial production as range trend would remain static. However, in those allotments (Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs and Smoky) where the significant reduction in livestock use under the initial allocation was 40 percent or less than the proposed action initial allocations, it was assumed that AUMs from improvement through management and land treatments that are outside big game and wild horse use areas would be allocated to livestock. Also, those AUMs in areas where water could be developed outside of big game and wild horse use areas would also become available for allocation to livestock.

All vegetation that is available in wild horse use areas would be allocated to wild horses. Vegetation would be allocated to big game up to total reasonable numbers in their use areas. Where use areas overlap, allocations would be made to reasonable numbers of big game and any remaining vegetation would go to wild horses. Livestock would be allocated vegetation in areas outside big game and wild horse use areas.

Except in eight allotments (Blue Eagle, Butterfield, Currant Ranch, Forest Moon, Hot Creek, Morey, Smoky, and Stone Cabin) allocation to big game equals reasonable numbers.

Example

Estimated future vegetation (AUMs)--Blue Eagle allotment

Available vegetation (1979)	1,536
Available vegetation (2015)	1,669
Estimated future use	
livestock	1,413
mule deer	0
antelope	9
bighorn sheep	50
elk	0
wild horses	0
Total vegetation used	1,472
Total unused	197

METHODOLOGY FOR DETERMINING IMPROVEMENT THROUGH MANAGEMENT

Improvement through management for each allotment was taken from the Tonopah URA-MFP. Improvement through management is the increase in grazing capacity directly attributed to intensified management. According to the Tonopah MFP this varies from 5-15 percent by allotment depending upon the ability of the range to improve. This was determined by:

1) Precipitation by allotment,
2) Soil types by allotment,
3) Vegetative types by allotment,
4) Professional judgement of Battle Mountain District, Tonopah Resource Area range conservationists, and
5) Information from the two existing AMPs (Willow Creek and Wagon Johnnie).

Those allotments under intensified management are expected to reach their potential in 35 years (year 2015). Those allotments under less intensive management are expected to reach 50 percent of their respective potential.

APPENDIX A

Section 2

METHODOLOGY FOR ESTIMATING AUMS AFTER VEGETATIVE MANIPULATION

Vegetative manipulation is proposed on approximately 35,205 acres in the Tonopah Resource Area. The 1959-64 range survey showed that production of the native vegetation on these sites averaged 60 acres/AUM. A weight-estimate range survey completed in 1977 on existing seedings in Monitor and Wagon Johnnie allotments showed vegetative production ranged from 4 to 7 acres/AUM (Tonopah District Files). Vallentine (1971 p. 201) showed "on fifteen BLM cattle allotments in western Utah, the carrying capacity on seeded range varied from 1.3 to 8.2 acres per AUM with an average of 3.8." Using the above data, it was determined that through vegetative manipulation and subsequent management, carrying capacity on the 35,205 acres would average 5 acres/AUM.

APPENDIX A

Section 3

METHODOLOGY FOR CALCULATING REASONABLE AND EXISTING NUMBERS OF BIG GAME BY ALLOTMENT

1) Percentage of habitat area within the allotments was calculated based on acreage calculated from NDW maps and BLM allotment boundaries.

EXAMPLE

Butterfield Allotment

Deer Habitat Areas in Allotment	Percent of Habitat Areas in Allotment
DW-9	16
DW-8	100
DW-7	82
DS-5	82

2) The percent of reasonable numbers within each allotment was then calculated. Reasonable numbers for each habitat area were taken from the table provided by NDW.

EXAMPLE

Butterfield Allotment

Habitat Areas	Percentage in Allotment		Total Reasonable Numbers in Habitat Area		Total Percentage Reasonable Numbers in Habitat Area
DW-9	16	x	426	=	68
DW-8	100	x	105	=	105
DW-7	82	x	910	=	746
DW-5	82	x	195	=	160
TOTAL Number of Deer in allotment					1,079

3) Existing numbers by allotment was calculated as follows: the NDW said there are 8,424 mule deer existing numbers and 14,867 mule deer reasonable numbers in the total resource area (Table A-4). Therefore:

$$\frac{\text{Total Reasonable Number in Allotment}}{\text{Total Reasonable Number in Resource Area}} = \frac{\text{Existing Number in Allotment}}{\text{Total Existing Number in Resource Area}}$$

APPENDIX A

Section 4

METHODOLOGY FOR COMPUTING HUNTER DAYS

Hunter day increases were computed by multiplying the number of new permits anticipated (due to herd increases) by the average hunter days per permit (a number received from the Nevada Department of Wildlife). Hunter days per permit were 4.2 days for mule deer and 3.1 days for antelope. The increase in hunter days was added to the existing 5,400 hunting days to get total hunter days.

EXAMPLE

240 new permits x 4.2 hunter days = 1,008 mule deer hunter days
12 new permits x 3.1 hunter days = 37 antelope hunter days
1,045 increase of hunter days.

1,045 increase hunter days + 5,400 existing hunter days = 6,445 total hunter days.

APPENDIX A, Section 3, TABLE A-4
IMPACTS TO MULE DEER POPULATIONS BY HABITAT AREA
FROM THE PROPOSED ACTION

Allotment	Habitat Area	Existing Numbers	Reasonable Numbers	Numbers Allocated
Butterfield	DW-9	38	68	20
	DW-8	59	105	104
	DS-5	91	160	62
	DW-7	423	746	393
Crater Black Rock	DW-16	44	77	77
Currant Ranch	DW-9	142	251	138
Forest Moon	DW-9	61	107	59
	DS-5	20	35	16
	DW-7	92	164	107
Hot Creek	DW-16	3	6	0
	DW-12	240	424	352
	DW-9	351	971	839
	DW-11	223	393	347
	DS-7	83	146	92
	DKW-9	870	653	366
	DKW-13	415	733	125
Ione	DW-2	38	68	67
	DW-3	7	12	11
	DS-2	38	67	42
Monitor	DW-3	33	56	48
Morey	DW-11	363	641	364
	DS-7	135	238	96
	DW-12	647	1142	653
	DKW-13	677	1195	171
Nyala	DW-16	42	74	74
	DW-6	5	9	9
Ralston	DW-3	32	56	56
	DW-8	11	20	18
Reveille	DW-9	118	208	144
	DW-1	94	166	166
	DS-1	36	64	50
	DKS-5	64	113	73
	DW-6	16	28	28
	DKW-9	92	163	134
	DW-16	33	59	55
	DW-2	33	60	60
Sand Spring	DW-12	37	65	65
	DW-16	45	80	62
	DW-14	39	68	66
	DS-8			
Smoky	DW-7	22	39	13
	DW-11	59	105	49
	DS-1	19	34	27
	DW-1	50	89	89
	DW-9	119	208	208
	DKS-5	78	138	107
	DW-8	23	41	41
	DW-9	413	728	326
Wagon Johnnie	DW-9	707	1,248	1,248
	DS-7	36	63	63
	DW-11	96	170	170
Willow Creek	DW-9	59	104	104

Source: Compiled in concurrence with Nevada Department of Wildlife and the Bureau of Land Management.

APPENDIX B

LIVESTOCK SUPPORT FACILITIES

SECTION 1

PROPOSED LIVESTOCK SUPPORT FACILITIES BY ALLOTMENT UNDER THE PROPOSED ACTION

SECTION 2

METHODOLOGY TO DETERMINE RANGE IMPROVEMENTS FOR LIVESTOCK REDUCTION / MAXIMIZING WILD HORSES ALTERNATIVE

APPENDIX B
SECTION 1
TABLE B-1
PROPOSED LIVESTOCK SUPPORT FACILITIES BY ALLOTMENT FOR THE PROPOSED ACTION

Allotment	Range Facilities							Land Treatments			Increased AUM Production	Costs c/
	Fences (Miles)	Wells	Springs	Troughs	Pipelines (Miles)	Earthen Reservoirs	Cattle-Guards	Spray	Burn	Seed		
Blue Eagle a/	18	0	0	0	0	0	2	0	0	0	75	43,800
Butterfield a/	18	0	3	5	1	0	2	0	0	0	207	57,400
Crater Black Rock	26	2	0	2	0	0	3	0	0	0	669	95,900
Currant Ranch	0	0	0	0	0	0	0	0	0	0	25	0
Forest Moon	0	0	0	0	0	0	0	0	0	0	0	0
Francisco a/	0	0	2	4	2	0	0	0	0	0	57	15,000
Hot Creek	20	0	0	4	10	0	4	0	0	0	797	94,800
Hunts Canyon	13	0	2	2	5	0	1	0	0	0	512	57,700
Ione	81	4	2	11	13	0	7	0	2,400	2,400	6,124	328,600
Monitor	41	1	0	3	3	0	7	8,725	0	8,725	2,053	283.350
Morey	12	0	1	2	2	0	3	0	0	0	206	42,900
Nyala	38	3	0	6	9	2	5	0	0	0	1,723	174,450
Ralston	113	3	0	7	17	0	10	0	0	0	2,797	385,300
Reveille	140	2	0	4	5	0	14	0	0	0	3,208	389,550
San Antone	85	0	5	12	35	0	16	0	0	0	6,171	379,200
Sand Springs	63	2	0	2	0	3	7	0	10,000	10,000	5,152	320,800
Smoky	52	0	1	1	3	0	2	0	0	0	760	137,400
Stone Cabin	87	2	4	11	13	0	19	7,680	6,400	14,080	4,593	535,140
Wagon Johnnie b/	0	0	0	0	0	0	0	0	0	0	500	0
Willow Creek b/	0	0	0	0	0	0	0	0	0	0	40	0
TOTALS	807	19	20	76	118	5	102	16,405	18,800	35,205	35,669	3,341,290

a/ These allotments are scheduled for less intensive management.

b/ Currently under approved Allotment Management Plan.

c/ Costs include construction plus maintenance and replacement.

Source: Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Management Framework Plan, 1979.

APPENDIX B

Section 2

METHODOLOGY TO DETERMINE RANGE IMPROVEMENTS
FOR LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

1) Allotments with an initial reduction of 40 percent or greater would not be managed intensively and would not have range improvements developed.

2) Allotments with an initial reduction of less than 40 percent would be managed intensively for livestock, but because no allocation would be made to livestock in big game or wild horse use areas, no range improvements would be done in these use areas, but only in areas used solely by livestock (Tables B-1 and B-2).

APPENDIX B
SECTION 2
TABLE B-2
PROPOSED LIVESTOCK SUPPORT FACILITIES FOR LIVESTOCK REDUCTION ALTERNATIVE

Allotment	Boundary Fences (Mi.)	Highway Fences (Mi.)	Interior Fences (Mi.)	Total Fences (Mi.)	Cattle-Guards (Ea.)	Wells (Ea.)	Spring Development (Ea.)	Pipelines (Mi.)	Troughs (Ea.)	Earthen Reservoirs (Ea.)	Spray	Seed	Cost
Blue Eagle a/	24	7	18	49	11	2	0	0	2	0	0	0	140,900
Butterfield	0	0	0	0	0	0	0	0	0	0	0	0	0
Crater Black Rock	0	0	0	0	0	0	0	0	0	0	0	0	0
Currant Ranch	0	0	0	0	0	0	0	0	0	0	0	0	0
Forest Moon	0	0	0	0	0	0	0	0	0	0	0	0	0
Francisco a/	0	0	12	12	5	0	2	5	4	0	0	0	61,200
Hot Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
Hunts Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0
Ione a/	30	0	28	58	13	6	2	13	12	0	0	0	269,950
Monitor a/	8	0	24	32	11	0	0	1	1	0	3,880	3,880	161,340
Morey	0	0	0	0	0	0	0	0	0	0	0	0	0
Nyala	0	0	0	0	0	0	0	0	0	0	0	0	0
Ralston	0	0	0	0	0	0	0	0	0	0	0	0	0
Reveille	0	0	0	0	0	0	0	0	0	0	0	0	0
San Antone a/	20	18	22	60	10	1	2	35	11	0	0	0	316,600
Sand Springs a/	32	13	3	48	10	2	0	0	2	0	0	0	144,900
Smoky a/	63	7	7	77	6	2	0	4	4	0	0	0	224,600
Stone Cabin	0	0	0	0	0	0	0	0	0	0	0	0	0
Wagon Johnnie	0	0	0	0	0	0	0	0	0	0	0	0	0
Willow Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	177	45	114	336	66	13	6	58	36	0	3,880	3,880	1,319,490

a/ These allotments would not be significantly reduced by wild horses or big game, therefore they will be put under intensive management with no allocation or improvements being done in wild horse or big game areas.

Source: Bureau of Land Management, Battle Mountain District, Tonopah Resource Area. Management Framework Plan, 1979.

APPENDIX C

METHODOLOGY FOR COMPUTING ANNUAL INCREASE IN WILD HORSES

APPENDIX C

METHODOLOGY FOR COMPUTING ANNUAL INCREASE IN WILD HORSES

According to BLM age distribution data gathered during a wild horse roundup in Stone Cabin Valley during 1975 and 1976, no horses were over 15 years of age.

Assume: All horses die at age 16. Thus, average annual adult mortality is 6.3 percent.

Colt to adult ratio from the same roundup in Stone Cabin Valley showed a colt/adult ratio of 18.8 colts/100 adults.

18.8	colts/100 adults
6.3	deaths/100 adults
12.5	percent annual increase

APPENDIX D

GUIDELINES FOR USE OF HERBICIDES ON PUBLIC LANDS

APPENDIX D

GUIDELINES FOR USE OF HERBICIDES ON PUBLIC LANDS

1) Environmental impacts will be identified through an environmental assessment and measures taken to mitigate potential adverse environmental impacts.

2) Programs will be reviewed with user groups, interested organizations, and the general public.

3) Only federally registered pesticides will be used on public lands except as authorized by Sec. 24c, Public Law 92-516, The Federal Environmental Pesticide Control Act of 1972. Section 24c provides for state registration of certain pesticides for local needs within the state. Any pesticide proposal planned under a state registration must include a copy of the state label.

4) Tank mixes of pesticides may be approved if: such mixture is provided for under a state registration or if the tank mix has been tested and has a written recommendation by an Agricultural Experiment Station or the State Department of Agriculture. The pesticide recommended in the mixture must be applied at a dosage rate not to exceed the label instructions for use of any single product for the same target pest and must not be specifically prohibited from mixing on either label. Each tank mix proposal must be accompanied by appropriate labels and/or a written recommendation.

5) All proposed use of herbicides on public lands will be reviewed for approval in advance by the Bureau's Denver Service Center and/or Washington, D.C. office.

6) Federal and state agencies with responsibilities for the environment, public health, and fish and wildlife will be informed, when necessary, of programs and cooperative measures developed.

7) Only properly trained and/or licensed personnel will handle and use herbicides on public lands. This includes applications by permittees, grantees, or licensees. At least one member of the crew, preferably the on-the-ground supervisor, must be a qualified applicator.

8) All individuals associated with the handling of applications of herbicides on public lands will be familiar with emergency procedures to be used in case of a herbicide spill.

9) Water monitoring of important streams will be done when there is a possibility that contamination may result from a proposed herbicide use.

PROJECT DESIGN FEATURES

Specific measures are included in the design of each proposed herbicide project in order to minimize adverse impacts on the environment. They include the following:

1) Any specific BLM proposed herbicide project will be preceded by a preliminary archaeological survey. An evaluation of the findings will determine whether there are sites of value and whether they should be salvaged by removal, or left and circumvented by the project.

2) BLM projects possibly affecting areas of historical value will be preceded by a search through the cultural and historical sites listings currently on file with the State Historic Preservation Officer and the State Parks Department. The latest edition of the National Register of Historic Places and its monthly supplement will be consulted prior to undertaking and work on proposed treatment areas. In cases where there is an effect from proposed projects, the Bureau will comply with Section 106 of the National Historic Preservation Act through the Council's "Procedures for the Preservation of Historic and Cultural Properties."

3) The process of locating, identifying, and managing significant concentrations of rare and endangered plants is in a developmental stage. The Federal Register of July 1, 1975 (Vol. 40, No. 127) contains a comprehensive list of candidate endangered or threatened species. In addition, a tentative list of plants that are proposed for inclusion on the Federal list of threatened or endangered species is available upon request (32 pages). If these plants are known or suspected to occur within the influence zone of the proposed action, an on-the-ground floristic inventory will be made. The proposed action will be modified to protect these plants if they are threatened by the proposed action.

4) On herbicide application projects conducted directly by Bureau personnel, a licensed employee will monitor and supervise the project. Work done by contractors will be monitored by a certified applicator.

5) Contracts for application will require that the intake operation of water for mixing shall be arranged so that an air gap or reservoir will be placed between the live water intake and the mixing tank to prevent any backflow of chemical into the water source.

6) Contracts for application will require that contractors will not wash out any spray tanks in or near any streams or dispose of any chemical containers on the contract area.

7) During aerial spraying, spray will be turned off at the end of spray runs and during the time when a turn is being made to start another spray run. Initial spray swaths along buffer strips or areas to be protected will be made parallel to these areas and before spraying commences on the rest of the project area.

8) Mixing and loading operations will take place in an area where an accidental spill will not flow into a stream or body of water.

9) The following are minimum widths (measure horizontally) for protective buffer strips for all herbicides applied adjacent to waters which are valuable for domestic use, are important for angling or other recreation and/or used by significant numbers of fish for spawning, rearing or migration routes (Class I streams), bodies of water, or marshy areas.

a) Aerial Spraying	
Spraying Altitude	Buffer Strip
(over ground) 30-40 feet	100 feet
b) Vehicle spraying	25 feet
c) Hand application	10 feet

10) To minimize drift and volatilization, aerial application of all the herbicides proposed for use will be confined to periods when wind speed is less than six miles per hour, air temperature is under 70° F., relative humidity is over 50 percent, vegetation is free of snow or ice, precipitation is not occurring or imminent, and air turbulence will not affect normal spray patterns. Label directions will be followed if they require additional restrictions. Low volatile ester formulation of 2,4-D will be used.

11) Daily measurements of weather conditions will be made by trained personnel at spray sites during application. Additional measurements will be made any time it appears that a weather change may be taking place that could jeopardize safe placement of spray on the target area.

12) Fixed wing or helicopters will normally be required to fly at an airspeed of 40 to 50 mph and 30 to 45 feet above the vegetation. Spray pressure in the boom will be 25 to 35 pounds per square inch. Maximum drift reduction with normal spray formulations and conventional application equipment will be obtained by using D8 jet nozzles (1/8 inch diameter orifice) directed back along the airstream (Stewart 1976). All aerial nozzles will be equipped with automatic shutoff devices to prevent loss of herbicides along nonspray flight routes. Spray mixtures will contain drift reduction adjuvants where they will be effective.

13) During air operations a radio network will be maintained which links all parts of the project. Direct radio communications between spray aircraft and ground observers will be established. Prespray reconnaissance flights will be made to orient pilots when sensitive areas such as agricultural lands, important streams, residences, and fish hatcheries are near spray target areas.

MONITORING ENVIRONMENTAL IMPACTS

The overall responsibility for monitoring environmental impacts of chemical herbicides rests with the Environmental Protection Agency (P.L. 92-516, Sec. 20). No Dioxin (TCDD) containing compounds will be used. Precise identification of the minute quantities involved and the interpretation of the findings requires the highly sophisticated research techniques and methodologies of research organizations. The Bureau's research needs are met by published research results from research agencies and by contracting for research when existing or planned research is judged inadequate.

Research on environmental impacats of herbicides to animals, water, soil, and plants conducted by chemical companies as a prerequisite to registration with the Environmental Protection Agency. Additional research is conducted by federal agencies and universities. The Bureau will keep abreast of these research findings and, where indicated by research results and EPA recommendations, adjust its proposed herbicide applications to minimize adverse environmental impacts.

A water monitoring program will be carried out by the Bureau as part of the proposed action. The purpose is to determine the effectiveness of buffer strips, and administrative controls in minimizing impacts

on water quality and the aquatic environment. The guidelines for when to monitor water are listed below.

1) Water monitoring will be done when any herbicide application occurs in a municipal watershed.

2) Water monitoring will be done when any herbicide application is located in a fish hatchery supply watershed.

3) Water monitoring will be done when any herbicide application is in a watershed with a domestic water supply intake for drinking or irrigation less than one mile downstream from the treatment area.

4) Water monitoring will be done where a herbicide application is adjacent to a major fish bearing stream.

SAFEGUARDS

The safe use of herbicides includes precautionary measures to prevent accidental spills. The following written precautions describe the measures that will be used to reduce the chance of such accidents, and the emergency action required if an accidental spill should occur.

The applicable federal regulations concerning the storage and disposal of herbicides and herbicide containers will be followed. These are described in the Environmental Protection Agency "Regulations for Acceptance and Procedures for Disposal and Storage," Federal Register, May 1, 1974, pp. 15236 through 15241.

Transportation

1) It is essential to prevent damage to containers so that leaks do not develop; care will be exercised so that the containers are not punctured or ruptured, and so that the lids or caps are not loosened.

2) Precautions will be taken in the loading and stacking of herbicide containers on the transporting vehicle to assure that containers are tied down so that they will not fall as the vehicle moves.

3) Open containers will never be transported. Partly empty containers must be securely re-sealed before transport.

4) After transportation, all herbicide containers will be inspected for damage and leaks, and the vehicle should be carefully examined for contamination.

visibility before and shortly after sunrise and sunset will not seriously affect the safety of the pilot.

2) Do not permit uphill spraying when the climb required exceeds one-half the climbing ability of the helicopter.

3) Allow spraying from a higher altitude where steep canyonheads, snags, or standing timber in the spray area make it hazardous to spray at the specified contract heights.

4) Allow sufficient elevation to be gained by the pilot at the lower open end of drainages after a spraying run to eliminate the need to climb in returning for another spray run.

5) Allow the contractor's chief pilot to establish a pattern to avoid danger of collision when pilots spray adjoining blocks concurrently.

6) Instruct pilot to stop spraying when in his own judgement conditions are too hazardous.

7) Fly at a height above the ground that will produce effective treatment results. In no case should the minimum flight height be less than 30 feet.

8) Caution pilots about dangers such as lone snags or trees and location of downdrafts. Review project maps with each pilot, paying particular attention to heliports, areas being sprayed, and approaches to and from those areas.

9) Caution pilots as to the location of telephone and electric lines near any heliport which will be used. Mark telephone and electric lines with highly visible material if it can be done safely.

10) If a helicopter crashes check the pilot's clothing to see if he has been splashed with herbicide. If so, and if he is not seriously injured, help him wash several times with soap.

11) When an injured pilot is taken to a hospital or doctor, make certain they know the pilot has been exposed to a herbicide and provide any herbicide label information that is available.

Tank Precautions

1) All valves capable of emptying the tanker will be lockable.

2) An air gap or reservoir between the water source and the mixing tank is required. A separate portable pump may be used.

APPENDIX E

WATERSHED

SECTION 1

PHASE 1 WATERSHED CONSERVATION AND DEVELOPMENT

SECTION 2

PRESENT EROSION CONDITION BY ALLOTMENT

SECTION 3

DETERMINATION OF SEDIMENT YIELD

APPENDIX E

Section 1

PHASE I WATERSHED CONSERVATION AND DEVELOPMENT

Data on erosion condition and vegetation were gathered in 1971-1974 using the Phase I Watershed Conservation and Development Inventory (WC&DI) as described in BLM Manual 7322. Information on sediment yield and plant species composition were also gathered for each representative area at the same time as the Phase I Inventory.

Representative areas were delineated within each allotment by vegetative type. Within each representative area a pace transect of 100 sample points was used, a reading taken at each point, and the type of ground cover (litter, bare ground, large or small rock, or vegetation by species) recorded. The location, degree and direction of slope, effective root depth, erosion condition class, and sediment yield factor rating were recorded.

APPENDIX E
SECTION 2
TABLE E-1
PRESENT EROSION CONDITION (ACRES)

Allotment	Barren or (unclassified)	Stable a/	Slight a/	Moderate a/	Critical a/
Blue Eagle			22,249	23,250	
Butterfield	26,710		75,459	19,911	
Crater Black Rock		17,838	76,847	3,174	
Currant Ranch			11,160		
Forest Moon			6,879		
Francisco			16,524	372	
Hot Creek		2,975	108,168	78,364	
Hunts Canyon			80,524	6,079	3,080
Ione	760		137,130	47,000	4,209
Monitor		23,506	50,234	18,395	4,203
Morey		2,147	25,951	88,913	1,598
Nyala	17,464	12,069	218,808	72,933	
Ralston	4,239	53,113	287,305	24,025	
Reveille	6,422	27,138	432,898	190,440	622
San Antone	1,253	8,098	341,181	81,198	9,096
Sand Springs	1,020	31,158	160,242	11,448	
Smoky	5,289		93,511	28,176	
Stone Cabin		16,266	329,227	48,457	3,101
Wagon Johnnie		5,996	67,589	24,642	6,009
Willow Creek			12,691		
TOTALS	63,157	200,304	2,554,577	766,777	31,918

a/ Terms defined in the Glossary under Erosion Condition Classes.

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Unit Resource Analysis, 1975.

APPENDIX E

Section 3

DETERMINATION OF SEDIMENT YIELD

The Bureau of Land Management's Phase I Water Conservation and Development Inventory (WC + DI) data, conducted in 1976, was used to determine sediment yield.

Phase I data categories consist of: surface geology, soil texture, climate, runoff, topography, ground cover type (bare ground, litter, plant, large or small rock), upland erosion, and channel erosion. These data were used with nomographs produced by the Denver Service Center to approximate data needed to predict present sediment yield.

The total was applied to the PSIAC conversion table to obtain a value for sediment yield (acre feet per square mile of 0.34). This figure is multiplied by the square miles in a unit to get total sediment yield. More information can be obtained from the Bureau of Land Management, Battle Mountain District Office.

APPENDIX F

VEGETATIVE TYPES

SECTION 1

VEGETATIVE TYPES BY ALLOTMENT

SECTION 2

MAJOR PLANT SPECIES
OF THE TONOPAH RESOURCE AREA
VEGETATION TYPES

SECTION 3

KEY PLANT SPECIES BY ALLOTMENT

APPENDIX F
Section 1
Table F-1
VEGETATION TYPES BY ALLOTMENT (ACRES)

Allotment	Type	Code	Acres	Percentage of Total by Allotment
Blue Eagle	Bunchgrass	012	2,612	5
	Pinyon-Juniper	091	11,787	26
	Shadscale	131	13,155	29
	Greasewood	141	17,945	40
TOTAL			45,499	100
Butterfield	*Other	07	25,633	21
	Bunchgrass	012	325	<1
	Pinyon-Juniper	091	49,038	40
	Shadscale	131	13,693	11
	Greasewood	141	33,391	28
TOTAL			122,080	100
Crater Black Rock	*Other	07	2,438	2
	Black & Low Sagebrush	043	21,015	21
	Shadscale	131	54,372	56
	Greasewood	141	7,680	8
	Winterfat	151	2,909	3
	Horsebrush	164	9,445	10
TOTAL			97,859	100
Currant Ranch	Pinyon-Juniper	091	11,160	100
TOTAL			11,160	100
Forest Moon	Pinyon-Juniper	091	6,879	100
TOTAL			6,879	100
Francisco	Big Sagebrush	041	4,356	26
	Shadscale	131	10,753	64
	Greasewood	141	504	3
	Winterfat	151	1,283	7
TOTAL			16,896	100
Hot Creek	Big Sagebrush	041	218	<1
	Black & Low Sagebrush	043	16,665	8
	Rabbitbrush	045	1,782	1
	Pinyon-Juniper	091	75,100	40
	Shadscale	131	70,081	37
	Greasewood	141	7,275	4
	Winterfat	151	9,400	5
	Horsebrush	164	8,986	5
TOTAL			189,507	100
Hunts Canyon	Big Sagebrush	041	850	1
	Black & Low Sagebrush	043	32,273	36
	Pinyon-Juniper	091	6,550	7
	Shadscale	131	40,260	45
	Greasewood	141	2,025	2
	Winterfat	151	7,725	9
TOTAL			89,683	100

APPENDIX F
Section 1
Table F-1
VEGETATION TYPES BY ALLOTMENT (ACRES)(continued)

Allotment	Type	Code	Acres	Percentage of Total by Allotment
Ione	Bunchgrass	012	2,622	1
	Big Sagebrush	041	22,030	12
	Black & Low Sagebrush	043	49,479	26
	Pinyon-Juniper	091	6,526	4
	Shadscale	131	8,135	4
	Greasewood	141	89,321	47
	Winterfat	151	10,986	6
Total			189,099	100
Monitor	Bunchgrass	012	4,242	4
	Perennial Forbs	031	1,832	2
	Big Sagebrush	041	8,493	9
	Black & Low Sagebrush	043	62,762	65
	Rabbitbrush	045	11,852	12
	Pinyon-Juniper	091	3,704	4
	Greasewood	141	3,453	4
Total			96,338	100
Morey	Big Sagebrush	041	3,046	3
	Black & Low Sagebrush	043	32,048	27
	Pinyon-Juniper	091	79,022	66
	Greasewood	141	1,967	2
	Horsebrush	164	2,526	2
Total			118,609	100
Nyala	*Other	07	27,739	9
	Black & Low Sagebrush	043	58,113	18
	Rabbitbrush	045	3,289	1
	Pinyon-Juniper	091	1,755	1
	Shadscale	131	77,510	24
	Greasewood	141	98,132	30
	Winterfat	151	3,395	1
	Horsebrush	164	51,341	16
Total			321,274	100
Ralston	*Other	07	3,845	1
	Midgrass	011	17,152	5
	Annual Forbs	183	2,245	1
	Big Sagebrush	041	208	<1
	Black & Low Sagebrush	043	88,076	24
	Rabbitbrush	045	13,670	4
	Pinyon-Juniper	091	3,700	1
	Shadscale	131	123,008	33
	Fourwing Saltbush	134	28,677	8
	Greasewood	141	57,058	15
	Winterfat	151	8,043	2
	Horsebrush	164	23,000	6
Total			368,682	100

APPENDIX F
Section 1
Table F-1
VEGETATION TYPES BY ALLOTMENT (ACRES)(continued)

Allotment	Type	Code	Acres	Percentage of Total by Allotment
Reveille	*Other	07	39,280	6
	Midgrass	011	1,935	<1
	Bunchgrass	012	4,140	1
	Perennial Forbs	031	2,418	<1
	Big Sagebrush	041	115,114	18
	Black & Low Sagebrush	043	29,514	5
	Rabbitbrush	045	27,345	4
	Pinyon-Juniper	091	88,647	13
	Shadscale	131	236,788	36
	Fourwing Saltbush	134	18,929	3
	Greasewood	141	47,291	7
	Winterfat	151	8,987	1
	Horsebrush	164	37,132	6
TOTAL			657,520	100
San Antone	*Other	07	2,376	1
	Bunchgrass	012	7,845	2
	Black & Low Sagebrush	043	47,279	11
	Pinyon-Juniper	091	7,639	2
	Shadscale	131	35,889	8
	Greasewood	141	299,195	67
	Winterfat	151	1,365	<1
	Horsebrush	164	39,238	9
TOTAL			440,826	100
Sand Springs	*Other	07	2,008	1
	Big Sagebrush	041	34,391	17
	Black & Low Sagebrush	043	58,654	29
	Rabbitbrush	045	37,447	18
	Mountain Mahogany	056	8,936	4
	Pinyon-Juniper	091	13,899	7
	Shadscale	131	28,552	14
	Greasewood	141	12,470	6
	Winterfat	151	4,928	3
	Horsebrush	164	2,583	1
TOTAL			203,868	100
Smoky	*Other	07	5,593	4
	Saltgrass	013	1,946	2
	Big Sagebrush	041	5,773	5
	Rabbitbrush	045	5,853	5
	Shadscale	131	15,721	12
	Greasewood	141	90,787	71
	Winterfat	151	1,303	1
TOTAL			126,976	100
Stone Cabin	*Other	07	434	<1
	Bunchgrass	012	280	<1
	Big Sagebrush	041	75,405	19
	Black & Low Sagebrush	043	59,120	15
	Rabbitbrush	045	65,216	16

APPENDIX F
Section 1
Table F-1
VEGETATION TYPES BY ALLOTMENT (ACRES)(continued)

Allotment	Type	Code	Acres	Percentage of Total by Allotment
	Pinyon-Juniper	091	86,830	22
	Shadscale	131	67,635	17
	Fourwing Saltbush	134	23,186	6
	Greasewood	141	3,796	1
	Winterfat	151	2,125	1
	Horsebrush	164	13,024	3
TOTAL			397,051	100
Wagon Johnnie	Bunchgrass	012	37,625	36
	Big Sagebrush	041	2,524	2
	Black & Low Sagebrush	043	27,762	27
	Pinyon-Juniper	091	31,331	30
	Greasewood	141	4,994	5
TOTAL			104,236	100
Willow Creek	Big Sagebrush	041	4,293	34
	Black & Low Sagebrush	043	3,530	28
	Pinyon-Juniper	091	4,868	38
TOTAL			12,691	100

*Includes dry lakes, saline flats, sand dunes, and lava flows.

APPENDIX F
SECTION 2
TABLE F-2
MAJOR PLANT SPECIES OF THE TONOPAH RESOURCE AREA VEGETATION TYPES

Type	Acres occupied	Percent of total resource area a/	Major species (Scientific abbreviation)	Average percent composition levels b/
Mid grass	19,087	1	Galleta (Hija)	34
			Indian ricegrass (Orhy)	27
			Greasewood (Save)	12
			Fourwing saltbush (Atca)	10
			Shadscale (Atco)	5
			Other	12
Bunch grass	59,691	2	Crested wheatgrass (Agde)	33
			Indian ricegrass (Orhy)	13
			Sand dropseed (Spcr)	13
			Winterfat (Eula)	6
			Greasewood (Save)	9
			Fourwing saltbush (Atca)	3
			Rabbitbrush (Chvi)	3
			Bud sagebrush (Arsp)	2
			Squirreltail (Sihy)	2
			Rye (Elci)	1
			Other	15
Saltgrass	1,946	<1	Saltgrass (Dist)	52
			Rabbitbrush (Chvi)	20
			Alkali sacaton (Spai)	15
			Other	13
Perennial forbs	4,250	<1	Globemallow (Spco)	55
			Rabbitbrush (Chvi)	20
			Halogeton (Hagl)	11
			Other	14
Annual forbs	2,245	<1	Halogeton (Hagl)	97
			Fourwing Saltbush (Atca)	1
			Winterfat (Eula)	1
			Shadscale (Atco)	1
Big sagebrush	276,701	8	Big sagebrush (Artr)	59
			Shadscale (Atco)	7
			Rabbitbrush (Chvi)	7
			Galleta (Hija)	6
			Sand dropseed (Spcr)	2
			Black sagebrush (Arno)	2
			Greasewood (Save)	1
			Winterfat (Eula)	1
			Juniper (Juos)	1
			Other	14
Black sagebrush and Low sagebrush	586,290	16	Black sagebrush (Arno)	60
			Big sagebrush (Artr)	5
			Rabbitbrush (Chvi)	5
			Shadscale (Atco)	4
			Pinyon-juniper (Pimo-Juos)	2
			Galleta (Hija)	2

APPENDIX F
SECTION 2
TABLE F-2 (continued)
MAJOR PLANT SPECIES OF THE TONOPAH RESOURCE AREA VEGETATION TYPES

Type	Acres occupied	Percent of total resource area a/	Major species (Scientific abbreviation)	Average percent composition levels b/
			Indian ricegrass (Orhy)	2
			Low sagebrush (Arar)	2
			Ephedra (Epne)	1
			Greasewood (Save)	1
			Stipa (Stco)	1
			Western wheatgrass (Agsm)	1
			Other	14
Rabbitbrush	166,454	5	Rabbitbrush (Chna)	59
			Shadscale (Atco)	10
			Greasewood (Save)	4
			Galleta (Hija)	3
			Alkali sacaton (Spai)	2
			Saltgrass (Dist)	2
			Winterfat (Eula)	2
			Big sagebrush (Artr)	2
			Hopsage (Grsp)	1
			Other	15
Mountain Mahogany	8,936	<1	Mahogany (Cele)	25
			Western wheatgrass (Agsm)	19
			Hopsage (Grsp)	16
			Black sagebrush (Arno)	10
			Other	30
Pinyon-juniper	488,435	13	Pinyon-juniper (Pimo-Juos)	42
			Black sagebrush (Arno)	30
			Big sagebrush (Artr)	6
			Low sagebrush (Arar)	4
			Rabbitbrush (Chvi)	1
			Greasewood (Save)	1
			Ephedra (Epne)	1
			Other	15
Shadscale	795,552	22	Shadscale (Atco)	54
			Greasewood (Save)	7
			Galleta (Hija)	7
			Bud sagebrush (Arsp)	4
			Rabbitbrush (Chvi)	4
			Black sagebrush (Arno)	2
			Winterfat (Eula)	2
			Horsebrush (Tegl)	2
			Indian ricegrass (Orhy)	1
			Other	17
Fourwing saltbush	70,792	2	Fourwing saltbush (Atca)	43
			Rabbitbrush (Chvi)	15
			Galleta (Hija)	12
			Shadscale (Atco)	4
			Winterfat (Eula)	4
			Other	22

APPENDIX F
SECTION 2
TABLE F-2 (continued)
MAJOR PLANT SPECIES OF THE TONOPAH RESOURCE AREA VEGETATION TYPES

Type	Acres occupied	Percent of total resource area a/	Major species (Scientific abbreviation)	Average percent composition levels b/
Greasewood	777,284	21	Greasewood (Save,Saba)	60
			Shadscale (Atco)	11
			Rabbitbrush (Chvi)	6
			Fourwing saltbush (Atca)	3
			Galleta (Hija)	2
			Saltgrass (Dist)	2
			Big sagebrush (Artr)	2
			Winterfat (Eula)	1
			Ephedra (Epne)	1
			Other	12
Winterfat	62,449	2	Winterfat (Eula)	59
			Rabbitbrush (Chvi)	13
			Shadscale (Atco)	8
			Bud sagebrush (Arsp)	4
			Indian ricegrass (Orhy)	2
			Halogeton (Hagl)	2
			Big sagebrush (Artr)	1
			Fourwing saltbush (Atca)	1
			Other	10
Horsebrush	187,275	5	Horsebrush (Tegl)	16
			Hopsage (Grsp)	13
			Galleta (Hija)	8
			Greasewood (Save)	5
			Shadscale (Atco)	5
			Ephedra (Epne)	4
			Indian ricegrass (Orhy)	4
			Halogeton (Hagl)	4
			Winterfat (Eula)	2
			Big sagebrush (Artr)	1
			Rabbitbrush (Chvi)	6
			Fourwing saltbush (Atca)	1
			Other	31
Other (Dry Lake) (Saline Flat) (Sand Dune) (Lava Flow)	109,346	3		
Unclassified	3,616,733	100		

a/ Percentage of total lands classified.

b/ The "percent composition" is the proportion of various plant species in relation to the total per given area. This relationship is expressed as a percent.

NOTE: Vegetative types were typed in accordance with Bureau of Land Management Phase One Watershed Inventory procedures.

Source: U.S. Department of the Interior, Battle Mountain District, Tonopah Resource Area Grazing Files, 1976.

APPENDIX F, Section 3, TABLE F-3
KEY PLANT SPECIES BY ALLOTMENT

Allotment	Key Species
Blue Eagle	Winterfat Indian ricegrass Galleta Budsage
Butterfield	Indian ricegrass Alkali sacaton Winterfat Bluebunch wheatgrass
Crater Black Rock	Winterfat Indian ricegrass
Currant Ranch	Bluebunch wheatgrass Bitterbrush
Forest Moon	Bluebunch wheatgrass Bitterbrush
Francisco	Indian ricegrass Winterfat
Hot Creek	Indian ricegrass Winterfat
Hunts Canyon	Indian ricegrass Winterfat
Ione	Indian ricegrass Winterfat
Monitor	Great Basin wildrye
Morey	Winterfat Bitterbrush Fourwing saltbush
Nyala	Indian ricegrass Winterfat
Ralston	Winterfat
Reveille	Indian ricegrass Winterfat
San Antone	Indian ricegrass Winterfat
Sand Springs	Bluebunch wheatgrass Indian ricegrass Winterfat Squirreltail
Smoky	Indian ricegrass Winterfat Alkali sacaton Great Basin wildrye
Stone Cabin	Indian ricegrass Galleta Winterfat Fourwing saltbush Bitterbrush
Wagon Johnnie	Indian ricegrass Crested wheatgrass Bluebunch wheatgrass Winterfat
Willow Creek	Needle-and-thread grass Indian ricegrass Bitterbrush

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area Range files, 1976.

APPENDIX G

LIVESTOCK FORAGE CONDITION AND APPARENT TREND

SECTION 1

LIVESTOCK FORAGE CONDITION

SECTION 2

APPARENT RANGE TREND

APPENDIX G

Section 1

LIVESTOCK FORAGE CONDITION

Livestock forage condition was determined in accordance with Instruction Memorandum WO 75-52, Change 1 and the draft BLM 4412 Manual, Physical Resource Studies. This manual is available in the Battle Mountain District Office for review. Condition of the range must include consideration of vegetation quality and quantity and soil erosion characteristics. Vegetation quality and quantity are the most important determinants of range condition for domestic livestock and wild horses and burros (BLM Manual 4412). Standards used were based on vegetation composition from Phase I Watershed Conservation and Development Inventory, 1971-1974 and the Soil Surface Factor (SSF) (Figure 1, Livestock Forage Condition Graph). Table G-1 shows livestock forage condition by allotment. Vegetation was classified as desirable, intermediate, and least desirable for cattle, sheep, and wild horses and burros:

1) Desirable plants: Are palatable, productive, and nutritious forage species, are often dominant under climax or near climax conditions, are long-lived, and have extensive root systems to aid in protecting the watershed against erosion. This category includes the important key species which are to be maintained or increased by intensive livestock management.

2) Intermediate plants: Are of secondary importance in the climax and are usually associated with, or indicative of, ecological successional stages. They replace the desirable plants as condition deteriorates and replace the least desirable plants as condition improves. They may be less palatable to grazing animals or be more resistant to grazing use.

3) Least desirable plants: Include those that are definitely the poorer species in an ecosystem and consist principally of annuals, invaders, noxious, and low value forage plants. All annuals and poisonous species are included in the classification.

Standards for classification into each condition class were as follows:

1) Good Condition: Composition is 40 percent or more of both desirable and intermediate species with at least 20 percent made up of desirable species. SSF is less than 40.

2) Fair condition: Composition is 15-39 percent of desirable and intermediate species with 5 or more percent made up of desirable species. SSF is less than 60. Also, those ecosystems where the composition comprises 60 percent or more of the intermediate species and less than 5 percent desirable species are present will be rated "fair condition" when the SSF is less than 60.

3) Poor condition: Composition is less than 15 percent desirable and intermediate species. SSF is more than 60. It should be noted that if the SSF of an ecosystem is more than 60, the site is rated in "poor" condition regardless of the plant composition.

4) Unclassified: Includes dry lakes, sand dunes, lava flows and private land.

Step-toe transects were used to collect necessary data from each major vegetative community in each allotment. Soil Surface Factor (SSF) was determined by:

The SSF is an expression of current erosion activity. Seven categories of surface features are considered by the fieldman in the examination of the area represented by each transect. Both wind and water erosion are considered as applicable to each category. These features are: soil movement, surface litter, surface rock, pedestalling, rills, flow patterns, and gullies. (BLM Manual 7322.11B8a).

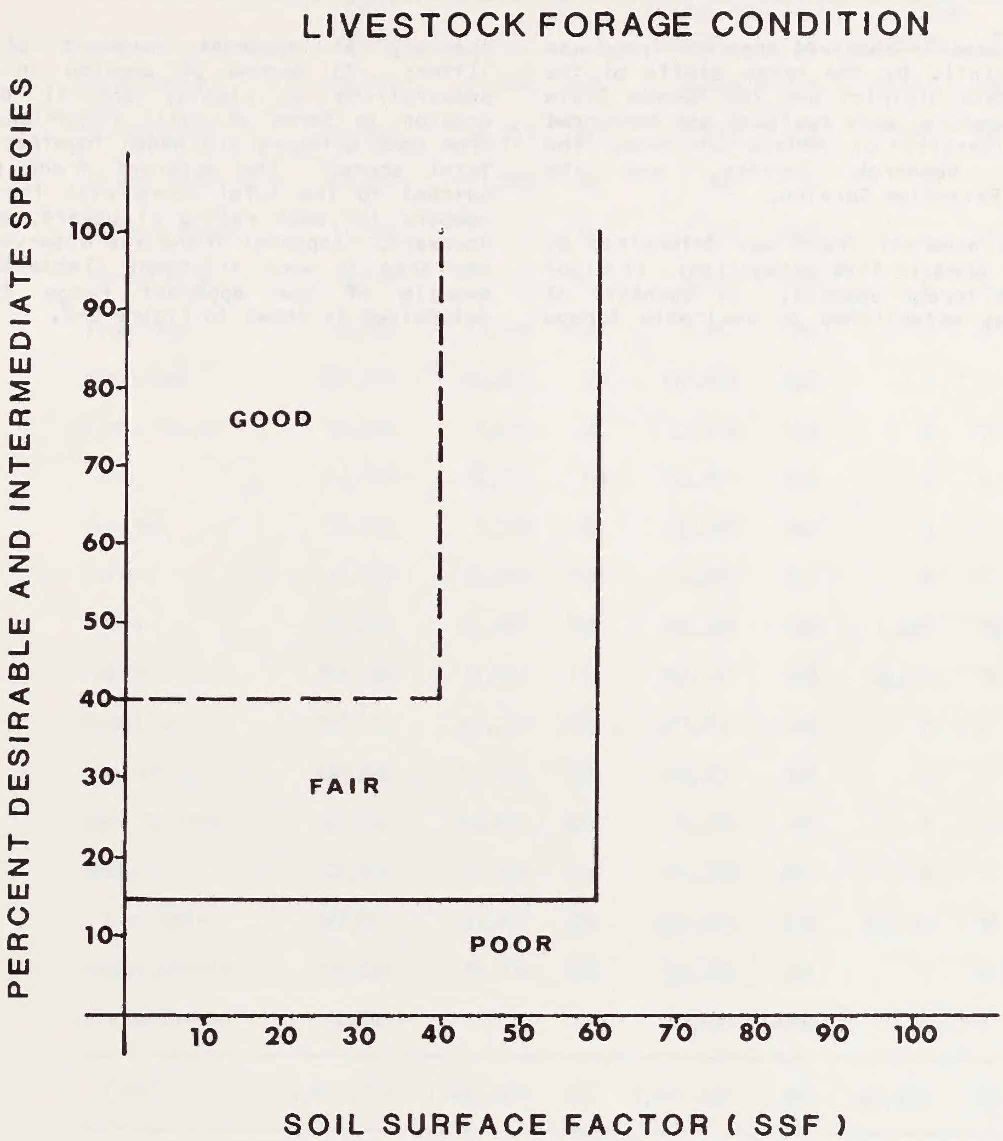
APPENDIX G
Section 1
TABLE G-1
LIVESTOCK FORAGE CONDITION (ACRES)

	Condition Class				
Allotment	Good Acres	Fair Acres	Poor Acres	Unclassified Acres a/	Total Acres
Blue Eagle	0	14,989	25,424	6,746	47,159
Butterfield	0	43,887	46,967	32,117	122,971
Crater Black Rock	22,929	38,767	18,499	18,129	98,324
Currant Ranch	0	9,991	950	219	11,160
Forest Moon	0	0	6,879	0	6,879
Francisco	0	12,731	5,391	0	18,122
Hot Creek	25,519	68,706	88,677	9,265	192,167
Hunts Canyon	4,502	15,468	70,012	415	90,397
Ione	2,529	68,151	119,420	0	190,100
Monitor	2,612	2,547	97,636	0	102,795
Morey	0	7,651	110,242	1,183	119,076
Nyala	25,370	88,545	169,098	44,128	327,141
Ralston	52,510	142,024	166,531	13,605	374,670
Reveille	3,138	61,286	562,581	32,482	659,487
San Antone	22,664	256,168	161,328	11,788	451,948
Sand Springs	36,590	79,492	75,269	12,552	203,903
Smoky	0	56,141	82,655	0	138,796
Stone Cabin	59,245	141,677	192,740	7,054	400,716
Wagon Johnnie	12,550	6,716	87,768	38	107,072
Willow Creek	0	3,950	8,741	0	12,691
TOTALS	270,158	1,118,887	2,096,808	189,721	3,675,574

a/ Includes dry lakes, sand dunes, lava flows, and private land.

Source: Bureau of Land Management, Battle Mountain District files, 1977.

APPENDIX G, FIGURE G-1



Source: BLM Draft Manual 4412, Physical Resource Studies.

APPENDIX G

Section 2

APPARENT RANGE TREND

Criteria used in observed apparent trend was developed jointly by the range staffs of the Battle Mountain District and the Nevada State Office. Procedures were reviewed and concurred with by University of Nevada at Reno, the Agricultural Research Service, and the Cooperative Extension Service.

Observed apparent trend was determined by rating a key area in five categories: 1) vigor of desirable forage species; 2) quantity of new seedlings established by desirable forage species; 3) apparent movement of surface litter; 4) degree of erosion in terms of pedestalling of plants; and 5) degree of erosion in terms of gully formation. Scores from each category are added together giving a total score. The apparent trend rating is matched to the total score with the range of numbers for each rating of upward, static, or downward. Apparent trend was observed in each key area in each allotment (Table G-2). An example of how apparent range trend was determined is shown in Figure G-2.

APPENDIX G
Section 2
TABLE G-2
APPARENT RANGE TREND a/

	Total Acres	Up Acres	Up %	No Apparent Trend Acres	No Apparent Trend %	Down Acres	Down %
Blue Eagle	45,499	20,368	45%	10,620	23%	14,511	32%
Butterfield	122,080	36,933	30%	73,593	60%	11,554	10%
Crater Black Rock	97,859	97,293	99%	566	1%	0	0
Currant Ranch	11,160	0	0	11,160	100%	0	0
Forest Moon	6,879	0	0	6,879	100%	0	0
Francisco	16,896	11,055	65%	5,841	35%	0	0
Hot Creek	189,507	33,624	18%	155,883	82%	0	0
Hunts Canyon	89,683	7,067	8%	82,616	92%	0	0
Ione	189,099	32,545	17%	156,554	83%	0	0
Monitor	96,338	3,558	4%	92,780	96%	0	0
Morey	118,609	16,548	14%	102,061	86%	0	0
Nyala	321,274	191,481	59%	128,766	40%	1,027	1%
Ralston	368,682	51,861	14%	304,547	83%	12,274	3%
Reveille	657,520	360,218	55%	297,302	45%	0	0
San Antone	440,826	271,401	62%	169,425	38%	0	0
Sand Springs	203,868	169,674	83%	34,194	17%	0	0
Smoky	126,976	13,778	11%	113,198	89	0	0
Stone Cabin	397,051	126,497	32%	248,444	63%	22,110	5%
Wagon Johnnie	104,236	39,904	38%	64,332	62%	0	0
Willow Creek	12,691	0	0	12,691	100%	0	0
TOTALS	3,616,733	1,483,805	41%	2,071,452	57%	61,476	2%

a/ The apparent trend information may not coincide with the present livestock forage condition or the proposed livestock adjustments in all allotments. Apparent range trend information represents only a single year's observation, therefore, it may or may not reflect the actual long-term trend of an area. It was obtained and used for analytical purposes only.

Source: Bureau of Land Management, Battle Mountain District files, 1977.

APPENDIX G

FIGURE G-2

OBSERVED APPARENT TREND

Allotment Ralston   Examiner T. Curry

Legal Description Key 6 - Plot 6   Date 7/20/77

(Check appropriate box in each category which best fits area being observed)

SEEDED VEGETATION		
8 points	☐	More than 50% of total vegetation is composed of seeded species. If shrubs are present, the seeded species occur mainly in open spaces between shrubs. Undesirable annual vegetation is absent or nearly so.
4 points	☐	25 to 50% of the total vegetation is composed of the seeded species. If shrubs are present, some seeded species occur in open unprotected areas. Limited amounts of undesirable annual vegetation are present.
1 point	☐	Less than 25% of the vegetation is composed of the seeded species. Seeded species are generally protected by shrubs or rocks. There is an over abundance of undesirable annuals and/or shrubs.
NATIVE VEGETATION 8 points	☒	More than 50% of the total vegetation is composed of species native to the plant community. Major native forage species are available, occuring in open, unprotected areas. Undesirable annual vegetation is absent or nearly so.
4 points	☐	25 to 50% of the vegetation is composed of species native to the plant community. Some major native forage species occur in open, unprotected areas. Limited amounts of undesirable annual vegetation is present.
1 point	☐	Less than 25% of the vegetation is composed of the species native to the plant community. Major forage species are generally protected by shrubs or rocks. An over abundance of undesirable annuals or shrubs exists.
REPRODUCTION 12 points	☐	Desirable vegetation is present in all age forms (seedlings, young, and mature plants). Invader or undesirable plants are decadent or absent, few established seedlings of such species are present.
8 points	☐	Age forms of desirable vegetation are represented by only mature plants and seedlings, 2-3 year old plants are absent or nearly so. Some seedlings and young plants of invader or undesirable species may or may not be present.
3 points	☒	Desirable vegetation is present only as mature or decadent plants, few if any seedlings are being established. All age forms of invader or undesirable plants are present and unprotected.
VIGOR 5 points	☐	Desirable grasses, forbs and shrubs are vigorous showing good health. Plants have good size, color and produce abundant herbage. Browse species show little or no hedging, leader growth is abundant.
3 points	☒	Desirable species show moderate vigor. Adequate herbage is produced with some seed stalks and seed heads present. Hedging is occurring, however, some leader growth is evident.
1 point	☐	Desirable species have low vigor. Plants appear unhealthy with small size and poor color. Portions of clumps or entire plants are dead or dying. Seed stalks and seed heads almost non-existent. Browse species show heavy hedging with little or no leader growth.
SOIL MOVEMENT 5 points	☒	No visual evidence of soil movement. Persistent surface litter where present is accumulating in place. Weather or lichen lines on stones or rock fragments are not apparent and extend to soil level.
3 points	☐	Soil movement is detectable. Persistent surface litter is deposited against obstacles. Weather or lichen lines on stones or rock fragments do not extend to soil level.
1 point	☐	Soil movement occurs with each event. Persistent surface litter is absent. Stones or rock fragments are pedestalled.
GULLIES 5 points	☐	Gullies may be present in stable condition with moderate sloping or rounded sided. Perennials should be establishing themselves on bottom and sides of channel.
3 points	☒	Gullies are well developed with small amounts of active erosion. Some vegetation may be established.
1 point	☐	Active gullies indicated by recent cutting and sloughing. Vegetation which is present has roots exposed.

TOTAL POINTS 22   Rating of Apparent Trend: 26-35 = upward; 17-25 = static; 7-16 = downward

Apparent Condition 4

General Comments:

APPENDIX H

LIVESTOCK FORAGE CONDITION, PROJECT DISTURBANCES AND APPARENT RANGE TREND CHANGES

SECTION 1

METHODOLOGY FOR DETERMINING CHANGE IN LIVESTOCK FORAGE CONDITION FOR THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

SECTION 2

PROJECT DISTURBANCE TOTALS FOR PROPOSED ACTION AND LIVESTOCK REDUCTION ALTERNATIVE

SECTION 3

APPARENT RANGE TREND FOR THE ALTERNATIVES INCLUDING THE PROPOSED ACTION FOR THE FUTURE

APPENDIX H

Section 1

METHODOLOGY FOR DETERMINING CHANGE IN LIVESTOCK FORAGE CONDITION FOR THE PROPOSED ACTION AND ALTERNATIVES

Changes in livestock forage condition were determined in accordance with Appendix G, Section 1 using the criteria below.

Livestock forage condition is not the same as ecological range condition and is based on the ability of the vegetation to provide sustained livestock forage. For this reason, changes in livestock forage condition are speculative and based on professional judgement. No research data are available to determine long-term changes. Changes in livestock forage condition would be slow due to low precipitation and the predicted changes are designed to be conservative.

Proposed Action

Intensive Management Allotments

Crater Black Rock, Currant Ranch, Forest Moon, Hot Creek, Hunts Canyon, Ione, Monitor, Nyala, Ralston, Reveille, San Antone, Sand Springs, Smoky, Stone Cabin, Wagon Johnnie, and Willow Creek (Table H-1).

Upward and Static Apparent Trend.

Good condition areas would remain the same.
Fair condition areas would improve one condition class to good condition.
Poor condition areas would improve one condition class to fair condition.
Unclassified areas would remain the same.

Downward Apparent Trend.

Good condition areas would remain the same.
Fair condition areas would remain the same.
Poor condition areas would remain the same.
Unclassified areas would remain the same.

Condition classes in wild horse use areas would remain the same.

Non-Intensive Management Allotments:

Blue Eagle, Butterfield, and Francisco (Table H-1).

Upward Apparent Trend.

Good condition areas would remain the same.
Fair condition areas would improve one condition class to good condition.
Poor condition areas would improve one condition class to fair condition.
Unclassified areas would remain the same.

Static and Downward Apparent Trend

Good condition areas would remain the same.
Fair condition areas would remain the same.
Poor condition areas would remain the same.
Unclassified areas would remain the same.

No Action Alternative

This alternative pertains to all allotments (Table H-2).

Upward Apparent Trend

Condition classes in wild horse use areas would decline one condition class if they are currently in good or fair condition.

Good condition areas would remain the same.
Fair condition areas would remain the same.
Poor condition areas would remain the same.
Unclassified would remain the same.

Static and Downward Apparent Trend

Good condition areas would decline one condition class to fair condition.
Fair condition areas would decline one condition class to poor condition.
Poor condition areas would remain the same.
Unclassified areas would remain the same.

No Livestock Grazing Alternative

This alternative pertains to all allotments (Table H-3).

Upward and Static Apparent Trend

Good condition areas would remain the same.
Fair condition areas would improve one condition class to good condition.
Poor condition areas would improve one condition class to fair condition.
Unclassified areas would remain the same.

APPENDIX H
SECTION 1
TABLE H-1
PROPOSED ACTION
ESTIMATED LIVESTOCK FORAGE CONDITION FOR THE FUTURE

Allotment	Condition Class (in Acres)				Total
	Good	Fair	Poor	Unclassified	
Blue Eagle	6,345	22,522	11,546	6,746	47,159
Butterfield	29,390	24,572	36,892	32,117	122,971
Crater Black Rock	61,696	18,499	0	18,129	98,324
Currant Ranch	9,474	1,467	0	219	11,160
Forest Moon	0	6,879	0	0	6,879
Francisco	10,356	2,375	5,391	0	18,122
Hot Creek	93,152	89,750	0	9,265	192,167
Hunts Canyon	6,362	68,692	14,928	415	90,397
Ione	70,680	119,420	0	0	190,100
Monitor	4,820	93,162	4,813	0	102,795
Morey	7,651	110,242	0	1,183	119,076
Nyala	113,915	164,549	4,549	44,128	327,141
Ralston	167,009	187,492	6,564	13,605	374,670
Reveille	25,540	148,841	452,624	32,482	659,487
San Antone	278,832	161,328	0	11,788	451,948
Sand Springs	116,082	75,269	0	12,552	203,903
Smoky	56,141	82,655	0	0	138,796
Stone Cabin	59,245	141,677	192,740	7,054	400,716
Wagon Johnnie	12,550	6,716	87,768	38	107,072
Willow Creek	3,950	8,741	0	0	12,691
TOTALS	1,133,190	1,534,848	817,815	189,721	3,675,574

Source: Extrapolated from Appendix G, Section I.

APPENDIX H
SECTION 1
TABLE H-2
NO ACTION ALTERNATIVE
ESTIMATED LIVESTOCK FORAGE CONDITION FOR THE FUTURE

Allotment	Condition Class (in Acres) Good	Fair	Poor	Unclassified	Total
Blue Eagle	0	5,618	34,795	6,746	47,159
Butterfield	0	31,230	59,624	32,117	122,971
Crater Black Rock	22,929	38,767	18,499	18,129	98,324
Currant Ranch	0	517	10,424	219	11,160
Forest Moon	0	0	6,879	0	6,879
Francisco	0	11,111	7,011	0	18,122
Hot Creek	4,041	46,439	132,422	9,265	192,167
Hunts Canyon	4,502	0	85,480	415	90,397
Ione	0	2,529	187,571	0	190,100
Monitor	2,612	339	99,844	0	102,795
Morey	0	998	116,895	1,183	119,076
Nyala	16,594	77,453	188,966	44,128	327,141
Ralston	6,472	55,411	299,182	13,605	374,670
Reveille	1,042	4,021	621,942	32,482	659,487
San Antone	17,474	162,835	259,851	11,788	451,948
Sand Springs	31,900	74,806	84,645	12,552	203,903
Smoky	0	10,235	128,561	0	138,796
Stone Cabin	0	59,245	334,417	7,054	400,716
Wagon Johnnie	0	12,550	94,484	38	107,072
Willow Creek	0	0	12,691	0	12,691
TOTALS	107,566	594,104	2,784,183	189,721	3,675,574

Source: Extrapolated from Appendix G, Section 1.

APPENDIX H
SECTION 1
TABLE H-3
NO LIVESTOCK GRAZING ALTERNATIVE
ESTIMATED LIVESTOCK FORAGE CONDITION FOR THE FUTURE

Allotment	Condition Class (in Acres) Good	Fair	Poor	Unclassified	Total
Blue Eagle	14,989	18,350	7,074	6,746	47,159
Butterfield	42,047	32,293	16,514	32,117	122,971
Crater Black Rock	61,696	18,499	0	18,129	98,324
Currant Ranch	9,474	1,467	0	219	11,160
Forest Moon	0	6,879	0	0	6,879
Francisco	12,731	5,391	0	0	18,122
Hot Creek	93,152	89,750	0	9,265	192,167
Hunts Canyon	6,362	68,692	14,928	415	90,397
Ione	70,680	119,420	0	0	190,100
Monitor	5,159	92,823	4,813	0	102,795
Morey	7,651	110,242	0	1,183	119,076
Nyala	113,915	164,549	4,549	44,128	327,141
Ralston	176,520	177,981	6,564	13,605	374,670
Reveille	25,540	148,841	452,624	32,482	659,487
San Antone	278,832	161,328	0	11,788	451,948
Sand Springs	116,082	75,269	0	12,552	203,903
Smoky	56,141	82,655	0	0	138,796
Stone Cabin	59,245	141,677	192,740	7,054	400,716
Wagon Johnnie	12,550	6,716	87,768	38	107,072
Willow Creek	3,950	8,741	0	0	12,691
TOTALS	1,166,716	1,531,563	787,574	189,721	3,675,574

Source: Extrapolated from Appendix G, Section 1.

Downward Apparent Trend

Good condition areas would remain the same. Fair condition areas would improve one condition class to good condition. Poor condition areas would remain the same. Unclassified areas would remain the same.

Condition classes in wild horse use areas would remain the same.

Livestock Reduction/Maximizing Wild Horses Alternative

Intensive Management Allotments--Blue Eagle, Francisco, Ione, Monitor, San Antone, Sand Springs, and Smoky. This methodology is the same as intensive management allotments for the proposed action (Table H-4).

Non-Intensive Management Allotments--Butterfield, Crater Black Rock, Currant Ranch, Hot Creek, Morey, Ralston, and Willow Creek. The methodology is the same as non-intensive management allotments for the proposed action (Table H-4).

No Livestock Grazing Allotments--Forest Moon, Hunts Canyon, Reveille, Stone Cabin, and Wagon Johnnie. All conditions would remain the same (Table H-4).

APPENDIX H
SECTION 1
TABLE H-4
LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE
ESTIMATED LIVESTOCK FORAGE CONDITION FOR THE FUTURE

	Condition Class (in Acres)				
Allotment	Good	Fair	Poor	Unclassified	Total
Blue Eagle	4,889	28,450	7,074	6,746	47,159
Butterfield	29,390	24,572	36,892	32,117	122,971
Crater Black Rock	61,696	18,499	0	18,129	98,324
Currant Ranch	0	9,991	950	219	11,160
Forest Moon	0	6,879	0	0	6,879
Francisco	12,731	5,391	0	0	18,122
Hot Creek	46,625	60,300	75,977	9,265	192,167
Hunts Canyon	6,362	13,608	70,012	415	90,397
Ione	70,680	119,420	0	0	190,100
Monitor	5,159	92,823	4,813	0	102,795
Morey	1,037	20,864	95,992	1,183	119,076
Nyala	91,222	114,695	77,096	44,128	327,141
Ralston	167,009	187,492	6,564	13,605	374,670
Reveille	3,138	61,286	562,581	32,482	659,487
San Antone	278,832	161,328	0	11,788	451,948
Sand Springs	116,082	75,269	0	12,552	203,903
Smoky	56,141	82,655	0	0	138,796
Stone Cabin	59,245	141,677	192,740	7,054	400,716
Wagon Johnnie	12,550	6,716	87,768	38	107,072
Willow Creek	0	3,950	8,741	0	12,691
TOTALS	1,022,788	1,235,865	1,227,200	189,721	3,675,574

Source: Extrapolated from Appendix G, Section 1.

APPENDIX H, SECTION 2, TABLE H-5
PROJECT DISTURBANCE TOTALS FOR THE PROPOSED ACTION

Project	Project Total	Acreage Factor	Total Acres Disturbed Short-Term	Total Acres Disturbed Long-Term
Spraying and Seeding	16,405 acres	--	16,405	0
Burning and Seeding	18,800 acres	—	18,800	0
Earthen Reservoirs & Sacrifice Areas	5 ea.	3.00 ac./ea.	15	15
Spring Developments	20 ea.	0.25 ac./ea.	5	0
Wells	19 ea.	0.25 ac./ea.	5	1
Pipelines	118 miles	1.00 ac./mi.	118	0
Fences	807 miles	1.00 ac./mi.	807	49
Troughs and Sacrifice Areas	76 ea.	1.00 ac./ea.	76	76
TOTALS			36,231	141

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District estimate.

TABLE H-6
PROJECT DISTURBANCE TOTALS FOR THE LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE

Project	Project Total	Acreage Factor	Total Acres Disturbed Short-Term	Total Acres Disturbed Long-Term
Spraying and Seeding	3,880 acres	—	3,880	0
Spring Developments	6 ea.	.25 ac./ea.	1.5	0
Wells	13 ea.	.25 ac./ea.	3.25	0
Pipelines	58 miles	1.00 ac./mi.	58	0
Fences	318.15 miles	1.00 ac./mi.	318.15	19
Troughs and Sacrifice Areas	36 ea.	1.00 ac./ea.	36	36
TOTALS			4,296.9	55

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District estimate.

APPENDIX H, Section 3, TABLE H-7
APPARENT RANGE TREND FOR THE PROPOSED ACTION

Allotment	Total Acres	Up Acres	Up %	No Apparent Trend Acres	No Apparent Trend %	Down Acres	Down %
Blue Eagle	45,499	20,406	45	25,093	55	0	0
Butterfield	122,080	61,780	51	60,300	49	0	0
Crater Black Rock	97,859	97,859	100	0	0	0	0
Currant Ranch	11,160	11,160	100	0	0	0	0
Forest Moon	6,879	6,879	100	0	0	0	0
Francisco	16,896	12,143	72	4,753	28	0	0
Hot Creek	189,507	189,507	100	0	0	0	0
Hunts Canyon	89,683	68,988	77	20,695	23	0	0
Ione	189,099	189,099	100	0	0	0	0
Monitor	96,338	91,249	95	5,089	5	0	0
Morey	118,609	118,609	100	0	0	0	0
Nyala	321,274	320,247	99	1,027	1	0	0
Ralston	368,682	306,485	83	62,197	17	0	0
Reveille	657,520	130,169	20	527,351	80	0	0
San Antone	440,826	440,826	100	0	0	0	0
Sand Springs	203,868	203,868	100	0	0	0	0
Smoky	126,976	126,976	100	0	0	0	0
Stone Cabin	397,051	0	0	397,051	100	0	0
Wagon Johnnie	104,236	0	0	104,236	100	0	0
Willow Creek	12,691	12,691	100	0	0	0	0
TOTALS	3,616,733	2,408,941	67	1,207,792	33	0	0

Source: Extrapolated from Appendix G, Section 2.

TABLE H-8
APPARENT RANGE TREND FOR THE NO ACTION ALTERNATIVE (Year 2015)

Allotment	Total Acres	Up Acres	Up %	No Apparent Trend Acres	No Apparent Trend %	Down Acres	Down %
Blue Eagle	45,499	0	0	19,245	42	26,254	58
Butterfield	122,080	0	0	34,333	28	87,747	72
Crater Black Rock	97,859	0	0	97,859	100	0	0
Currant Ranch	11,160	0	0	0	0	11,160	100
Forest Moon	6,879	0	0	0	0	6,879	100
Francisco	16,896	0	0	9,831	58	7,065	42
Hot Creek	189,507	0	0	37,875	20	151,632	80
Hunts Canyon	89,683	0	0	4,623	5	85,060	95
Ione	189,099	0	0	31,782	17	157,317	83
Monitor	96,338	0	0	3,249	3	93,089	97
Morey	118,609	0	0	17,790	15	100,819	85
Nyala	321,274	0	0	205,631	64	115,643	36
Ralston	368,682	0	0	26,953	7	341,729	93
Reveille	657,520	0	0	10,851	2	646,669	98
San Antone	440,826	0	0	273,575	62	167,251	38
Sand Springs	203,868	0	0	165,340	81	38,528	19
Smoky	126,976	0	0	12,828	10	114,148	90
Stone Cabin	397,051	0	0	0	0	397,051	100
Wagon Johnnie	104,236	0	0	0	0	104,236	100
Willow Creek	12,691	0	0	0	0	12,691	100
TOTALS	3,616,733	0	0	951,765	26	2,664,968	74

Source: Extrapolated from Appendix G, Section 2.

APPENDIX H, Section 3, TABLE H-9
APPARENT RANGE TREND FOR THE NO LIVESTOCK GRAZING ALTERNATIVE (Year 2015)

Allotment	Total Acres	Up Acres	Up %	No Apparent Trend Acres	No Apparent Trend %	Down Acres	Down %
Blue Eagle	45,499	37,547	83	7,952	17	0	0
Butterfield	122,080	109,403	90	12,677	10	0	0
Crater Black Rock	97,859	97,859	100	0	0	0	0
Currant Ranch	11,160	11,160	100	0	0	0	0
Forest Moon	6,879	6,879	100	0	0	0	0
Francisco	16,896	16,896	100	0	0	0	0
Hot Creek	189,507	189,507	100	0	0	0	0
Hunts Canyon	89,683	68,988	77	20,695	23	0	0
Ione	189,099	189,099	100	0	0	0	0
Monitor	96,338	91,249	95	5,089	5	0	0
Morey	118,609	118,609	100	0	0	0	0
Nyala	321,274	320,247	99	1,027	1	0	0
Ralston	368,682	306,485	83	62,197	17	0	0
Reveille	657,520	130,169	20	527,351	80	0	0
San Antone	440,826	440,826	100	0	0	0	0
Sand Springs	203,868	203,868	100	0	0	0	0
Smoky	126,976	126,976	100	0	0	0	0
Stone Cabin	397,051	0	0	397,051	100	0	0
Wagon Johnnie	104,236	0	0	104,236	100	0	0
Willow Creek	12,691	12,691	100	0	0	0	0
TOTALS	3,616,733	2,478,458	69	1,138,275	31	0	0

Source: Extrapolated from Appendix G, Section 2.

TABLE H-10
APPARENT RANGE TREND FOR THE LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES ALTERNATIVE (Year 2015)

Allotment	Total Acres	Up Acres	Up %	No Apparent Trend Acres	No Apparent Trend %	Down Acres	Down %
Blue Eagle	45,499	32,543	72	12,956	28	0	0
Butterfield	122,080	61,780	51	60,300	49	0	0
Crater Black Rock	97,859	97,859	100	0	0	0	0
Currant Ranch	11,160	0	0	11,160	100	0	0
Forest Moon	6,879	0	0	6,879	100	0	0
Francisco	16,896	16,896	100	0	0	0	0
Hot Creek	189,507	38,406	20	151,101	80	0	0
Hunts Canyon	89,683	0	0	89,683	100	0	0
Ione	189,099	189,099	100	0	0	0	0
Monitor	96,338	91,249	95	5,089	5	0	0
Morey	118,609	15,613	13	102,996	87	0	0
Nyala	321,274	205,631	64	115,643	36	0	0
Ralston	368,682	26,953	7	341,729	93	0	0
Reveille	657,520	0	0	657,520	100	0	0
San Antone	440,826	440,826	100	0	0	0	0
Sand Springs	203,868	203,868	100	0	0	0	0
Smoky	126,976	126,976	100	0	0	0	0
Stone Cabin	397,051	0	0	397,051	100	0	0
Wagon Johnnie	104,236	0	0	104,236	100	0	0
Willow Creek	12,691	0	0	12,691	100	0	0
TOTALS	3,616,733	1,547,699	43	2,069,034	57	0	0

Source: Extrapolated from Appendix G, Section 2.

APPENDIX I

METHODOLOGY FOR PREDICTING IMPACTS TO CULTURAL RESOURCES

APPENDIX I

METHODOLOGY FOR PREDICTING IMPACTS TO CULTURAL RESOURCES

Minimal data is available from previous cultural resources surveys conducted for livestock support facilities constructed in the Tonopah Resource Area. Cultural resources surveys have been conducted on 105 miles of fence, no wells, 10 troughs, 24 miles of pipelines, no storage tanks, 2 cattleguards, and 3,496 acres of land treatments (seedings). Table I-1 shows the number of cultural resources sites encountered in each management category. Table I-2 gives the frequency of sites encountered per project unit (mile/number/acre). The frequency is obtained by dividing the total number of sites encountered for each management category by the total number of units surveyed. This frequency can be projected to the number of livestock support facilities for the proposed action and alternatives containing proposed facilities.

APPENDIX I, TABLE I-1
NUMBER OF CULTURAL RESOURCES RECORDED FOR PAST RANGE FACILITIES AND LAND TREATMENTS

Project Type	Miles/acres/ number Inventoried	Open Aboriginal	Isolated Find	Euro-Am. Historic	Aboriginal Historic	Rock Shelter	Rock Art
Wells	(no data)						
Pipelines	25 miles	7	3	4	0	0	0
Storage Tanks	(no data)						
Springs	168	127	13	30	4	12	2
Troughs	10	0	0	0	0	0	0
Fences	105 miles	32	21	10	0	0	0
Cattle-guards	2	0	0	0	0	0	0
Spraying	(no data)						
Burning	(no data)						
Seeding	3,496 acres	14	1 a/	0	0	0	0
TOTALS		180	38	44	4	12	2

a/ The data for seedings is not comparable to that for other projects because several small sites and isolated finds were lumped under single site numbers and cannot be broken out.

Source: Compiled August 1979 from Tonopah Resource Area Cultural Resource Inventory files.

APPENDIX I, TABLE I-2
NUMBER OF CULTURAL RESOURCES SITES RECORDED FOR PAST RANGE FACILITIES AND LAND TREATMENTS PER PROJECT UNIT (MILE/ACRE/NUMBER)

Project Type	Open Aboriginal	Isolated Find	Euro-Am. Historic	Aboriginal Historic	Rock Shelter	Rock Art
Pipelines	0.29	0.13	0.17	0	0	0
Springs	0.76	0.08	0.18	0.02	0.07	0.01
Troughs	0	0	0	0	0	0
Fences	0.30	0.20	0.09	0	0	0
Cattle-guards	0	0	0	0	0	0
Seedings	0.004	--	0	0	0	0

Source: Compiled from Table I-1.

APPENDIX J

THE VISUAL RESOURCE MANAGEMENT SYSTEM

APPENDIX J

THE VISUAL RESOURCES MANAGEMENT SYSTEM

The BLM Visual Resource Management (VRM) system evaluates the landscape by the quality of its scenery (scenic quality rating), the sensitivity of an area to visual change (visual sensitivity levels), and the distance of an area from viewing points (visual zones). Visual resource specialists map these characteristics and use them to compile a composite map on which they assign areas to one of five possible VRM classes. They then use VRM classes to determine the degree of allowable contrast for a proposed management activity or project (Table J-1 and J-2).

VRM classes, their objectives, and required management practices are as follows (from BLM Manual 8411 and 8431):

Class I--This class provides primarily for natural ecological changes; however, it does not preclude limited management activity. Any contrast created within the characteristic environment must not attract attention. It is applied to wilderness areas, some natural areas, wild portions of wild and scenic rivers, and other similar situations where management activities are to be restricted.

Class II--Changes in any of the basic elements (form, line, color, and texture) caused by a management activity should not be evident in the characteristic landscape. A contrast may be seen but should not attract attention.

Class III--Contrasts to the basic elements (form, line, color, and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the existing characteristic landscape.

Class IV--Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape.

Class V--Change is needed or change may add acceptable visual variety to an area. This class applies to areas where the naturalistic character has been disturbed to a point where rehabilitation is needed to bring it back into character with the surrounding landscape. This class would apply to areas identified in the scenic evaluation where the quality class has been reduced because of unacceptable cultural modification. The contrast is inharmonious with the characteristic landscape. It may also be applied to areas that have the potential for enhancement, i.e., add acceptable visual variety to an area/site. It should be considered an interim or short-term classification until one of the other VRM class objectives can be reached through rehabilitation or enhancement. The desired visual resource management class should be identified.

The degree to which a management activity affects the visual quality of the landscape depends upon the amount of visual contrast that is created between the activity and the existing landscape character. The amount of contrast between a proposed activity and the existing landscape character can be measured by separating the landscape into its major features (land and water surface, vegetation, and structures) and then predicting the magnitude of change in contrast of each of the basic elements (form, line, color, and texture) to each of the features. Assessing the amount of contrast for a proposed activity in this manner would indicate the severity of impact and serve as a guide in determining what is required to reduce the contrast to the point where it would meet the visual management classes requirements for the area.

Class I--The degree of contrast for any one element may not exceed a weak degree of contrast (1x), and the total contrast rating for and feature may not exceed 10.

Class II--The degree of contrast for any one element should not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed 12.

Class III--The degree of contrast for any one element should not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed 16.

Class IV--The total contrast rating for any feature should not exceed 20.

Class V--An interim classification for rehabilitation of an area, based upon its indicated potential visual resource management class (I, II, III, or IV), it must meet the appropriate degree of contrast of selected class.

APPENDIX J
TABLE J-1
AVERAGE VISUAL IMPACTS FOR RANGE IMPROVEMENTS
(Long-Term)

Improvement	Max Element Contrast	Max Feature Contrast	Allowable VRM Class a/
Wells	Moderate (2x)	10	Class II
Pipelines	Moderate (2x)	8	Class II
Storage Tanks	Moderate (2x)	12	Class III
Spring Developments	Moderate (2x)	11	Class III
Troughs	Moderate (2x)	4	Class II
Fences b/	Weak (1x)	9	Class I
Exclosure Fences	Moderate (2x)	9	Class II
Cattleguards c/	Weak (1x)	3	Class I
Land Treatments:			
w/seeding	Strong (3x)	9	Class IV
w/o seeding	Moderate (2x)	6	Class II

a/ For the contrast listed at left this is the most restrictive management class in which the project could be located without creating a significant impact.

b/ This rating is for fences where there is no blading of the fence line or access routes and approximately even grazing occurs on both sides of the fence. A fence usually creates a Class II level of impact if a contrast in vegetation occurs. Along the major roads the vegetation contrast is inconsequential because of the linear elements in the visual environment and the Class I value is valid.

c/ Cattleguards are visually insignificant compared to the associated road and fence.

Source: Developed from visual contrast ratings submitted with environmental assessments and by rating existing facilities. Any particular project's impact may vary.

Appendix J
TABLE J-2
VISUAL RESOURCE MANAGEMENT UNITS BY ALLOTMENT IN ACRES

Allotment	I	II	III	IV
Blue Eagle	0	38,200	8,900	0
Butterfield	0	118,100	4,900	0
Crater Black Rock	500	48,900	20,600	28,300
Currant Ranch	N/A	N/A	N/A	N/A
Forest Moon	N/A	N/A	N/A	N/A
Francisco	0	3,900	14,200	0
Hot Creek	500	30,600	111,200	49,800
Hunts Canyon	0	20,800	6,300	63,300
Ione	500	7,500	41,700	140,400
Monitor	0	41,100	61,000	700
Morey	0	2,300	79,800	36,900
Nyala	0	71,900	36,000	219,200
Ralston	0	26,200	93,600	254,800
Reveille	0	151,600	250,605	257,200
San Antone	0	36,100	40,600	357,200
Sand Springs	0	38,700	138,600	26,600
Smoky	0	12,500	105,400	20,900
Stone Cabin	0	76,100	208,300	116,300
Wagon Johnnie	1,000	2,200	89,800	17,500
Willow Creek	0	0	0	12,700
Total	2,500	726,700	1,311,505	1,601,800

Source: U.S. Department of the Interior, Bureau of Land Management, Battle Mountain District, Tonopah Resource Area, Management Framework Plan, 1979.

APPENDIX K

METHODOLOGY FOR DETERMINING SOCIAL-ECONOMICS IMPACTS

APPENDIX K

METHODOLOGY FOR DETERMINING SOCIAL-ECONOMIC IMPACTS

ECONOMIC IMPACTS ON RANCHER

Basic information on ranch operation in Tonopah was gathered through district grazing files and formal discussions with ranchers. Table 2-13 shows ranching operations in each allotment. Individual operations were aggregated by allotment to derive Table K-1. Changes in AUMs and costs were apportioned by operator in each allotment on the basis of 1978 authorized livestock demand (preference).

Cattle ranches were divided into three size categories: small ranches; 40-200 head, medium ranches 250-600 head, and large ranches 760-5000 head. Worksheets describing typical ranches in the area were developed by the Economics, Statistics, and Cooperatives Service (ESCS). The worksheets were presented to area ranchers through the Tonopah Producers Panel (a local chapter of the Nevada Cattlemen's Association) for verification. The corrected worksheets along with budget data gathered by ESCS as part of a national cost of production study (USDA, ESCS 1979) were used to generate complete budgets for each size category of typical cattle ranches in the area. The ranch budgets appear in Tables K-2 through K-5.

A linear programing model was developed for each typical cattle ranch based on these budgets. The linear programing model maximizes ranch income based on a series of production parameters and constraints. For example, a rancher may produce a constrained amount of hay at $22 per ton and buy unconstrained amounts of hay at $60 per ton. The amount of BLM grazing available enters the model at a constrained level equal to that used by the typical ranch (Table 2-13).

To determine the economic impacts on the ranch, the level of grazing was varied (increased, decreased, or eliminated for two months). To figure the impacts of the initial allocations it was assumed that ranchers who were not currently using their full livestock preference would continue at their five year average use level. Therefore, only ranches where the proposed level was below the five year use level were evaluated. In the long run it was assumed that all the BLM grazing preference would be utilized. This tends to over estimate the long range benefits because it includes the change from the five year average to the active preference level as part of the benefit. Long run losses were not aggregated with long-term gains. Average changes were evaluated using the linear programing models for those ranches that had significant changes. Changes that were not significant (less than 1 percent of feed requirements) were evaluated based on costs of hay feeding. Although this creates more categories to be evaluated it was felt that this procedure better represented the actual impacts.

All sheep ranches are based outside the area and sheep use in the area is considerably under active preference. Sheep operations are significantly impacted only under the No Grazing alternative. Therefore, a less intensive procedure was used in impact evaluation. A range sheep budget previously developed by ESCS (USDA, ESCS 1979) was used. The budget is shown in Table K-5. Economic losses were evaluated based on costs of hay feeding.

Costs of range improvements in AMPs to the ranchers were apportioned by the number of active preference AUMs in the allotment.

ECONOMIC IMPACTS OF HUNTING

Hunting impact on the local economy was based on an estimate of expenditures in the region developed by the Forest Service. (USDA, FS, 1979). Expenditures for big game hunting were estimated at $18 per hunter day and $7 per hunter day for small game. In 1978, 5,400 deer and antelope hunter days occurred in these areas. This represents an expenditure of $97,200 ($18/day x 5,400 hunter days). The Tonopah PAA estimated that 2,300 hunter days were expended for small game for an area wide expenditure of $16,100 ($7/day x 2,300 days). Employment was estimated at 1.13 and .44 equivalent work years per 1,000 hunter days of big and small game. Regional income was estimated at $1,830 and $3,350 per 1,000 hunter days of big and small game (USDA, FS 1979). Current hunting related employment in the area was 7.1 man years (5,400 big game hunter days x .00113/day + 2,300 small game hunter days x .00044/day). Hunting related income equaled $50,100 (5,400 big game hunter days x $7.85/day + 2,300 small game hunter days x $3.35/day).

Future expenditures, employment, and income was evaluated based on the same coefficients as part of the regional input-output model described in the next section. Changes in hunter days are described in Table K-6.

The total value of hunting to those who participate that are not fully measured by local expenditures, may occur for equipment and supplies. Income may be forgone while traveling to the hunting sites. In addition,

TABLE K-1
INFORMATION BY OPERATOR BY ALLOTMENT a/
PROPOSED ACTION AND LIVESTOCK REDUCTION/MAXIMIZING WILD HORSES b/

	Existing Situation c/			Proposed Action					Livestock Reduction		
Operator Allotment Code	1978 Authorized Livestock Demand AUMs	5 Year Average Use (AUMS) d/	1978-1979 Licensed Use (AUMs)	AUM Allocation e/ Initial	AUM Allocation e/ Future	AUMs in Conflict With Periods-of-use f/	AMP Rancher Maintenance Cost (Dollars)	AUMs Under Implementation Assumption	AUM Allocation g/ Initial	AUM Allocation g/ Future	AMP Rancher Maintenance Cost Year(Dollars) h/
A--Smoky	120	120	120	120	134	0	$ 22	120	86	115	$ 28
G--Ione	940	681	564	940	1,474	564	169	940	877	940	136
S--Ione	1,350	23	NU	1,350	2,116	NU	243	1,350	1,260	1,350	195
K--Wagon Johnnie	4,359	3,172	3,866	4,359	4,824	1,327	0	4,068	0	0	
Stone Cabin	10,173	7,923	5,297	8,451	10,861	1,375	1,475	2,055	0	0	0
K--TOTAL	14,532	11,095	9,163	12,810	15,685	2,702	1,475	6,123	0	0	
J--Sand Springs	927	513	288	822	1,263	0	137	736	579	927	65
B--Smoky	1,030	1,030	1,030	1,030	1,150	310	194	1,030	739	983	237
C--Stone Cabin	1,892	1,332	1,887	1,572	2,020	176	274	382	0	0	0
U--Sand Springs	788	NU	NU	698	1,073	NU	116	625	492	788	56
L--Reveille	25,730	25,797	25,730	25,730	28,378	4,878	3,020	16,347	0	0	
V--Sand Springs	928	NU	NU	823	1,262	NU	137	736	580	928	65
H--Currant Ranch	105	105	105	105	106	105	0	105	24	24	0
O--Currant Ranch	177	62	NU	177	180	NU	0	177	40	40	0
M--Ralston	14,695	13,034	13,516	14,098	16,893	2,844	915	14,011	3,627	3,627	
Monitor	3,862	3,472	3,591	2,949	4,917	402	2,500	2,948	2,395	3,069	741
M--TOTAL	18,557	16,506	17,107	17,047	21,810	3,246	3,415	16,959	6,022	6,696	
I--Butterfield	4,779	1,464	1,514	2,934	3,071	500	525	2,934	633	633	
W--Sand Springs	2,221	1,296	NU	1,969	3,023	NU	329	1,763	1,387	2,221	157
E--Francisco	1,299	1,008	1,114	1,114	1,171	220	110	1,114	1,114	1,228	400
X--Ione	2,338	984	2,333	2,338	3,665	143	421	2,338	2,182	2,338	339
N--Sand Springs	3,918	3,526	3,892	3,473	5,333	608	580	3,110	2,448	3,918	276
Crater Black Rock	5,725	5,217	5,725	3,348	4,017	540	590	3,348	1,075	1,075	
Hot Creek	8,850	7,118	8,668	4,434	4,775	1,428	520	3,583	3,719	3,719	0
Morey	2,250	1,698	2,000	815	841	250	325	0	638	638	
N--TOTAL	20,743	17,559	20,285	12,070	14,966	2,826	2,015	10,041	7,880	9,350	276
O--Nyala	16,157	13,741	16,473	12,029	13,752	2,400	1,080	11,449	3,651	3,651	
F--Blue Eagle	2,024	1,287	435	1,505	1,565	82	380	1,505	1,331	1,413	1,110
P--Stone Cabin	3,179	3,138	3,179	2,641	3,394	620	461	642	0	0	0
Hunts Canyon	3,741	3,703	3,642	2,821	3,325	1,090	340	2,694	2	2	
Monitor	149	101	NU	114	190	NU	35	114	92	118	29
Willow Creek	338	270	340	338	378	0	0	277	169	169	
P--TOTAL	7,407	7,212	7,161	5,914	7,287	1,710	836	3,727	263	289	
Y--Sand Springs	810	NU	NU	718	1,103	NU	120	643	506	810	57
J--Forest Moon	253	65	81	36	36	68	0	36	0	0	
Z--Sand Springs	1,189	NU	NU	1,054	1,618	NU	176	944	743	1,189	84
Q--Ione	5,848	3,449	3,300	5,848	9,168	300	1,053	5,848	5,457	5,848	847
R--Smoky	4,671	2,980	2,468	4,671	5,216	0	879	4,671	3,350	4,459	1,075
San Antona	13,205	10,515	11,657	10,667	16,710	3,580	2,175	10,639	10,489	13,205	1,550
Ione	300	117	134	300	470	117	54	300	280	300	43
K--TOTAL	18,176	13,612	14,259	15,638	22,396	3,697	3,108	15,610	14,119	17,964	2,668
GRAND TOTALS	150,320	118,941	122,949	126,391	159,472	23,927	$19,355	103,582	49,965	59,725	$7,490

NU = Nonuse.

a/ Tonopah Resource Area

b/ No Action alternative based on five year average use (existing situation): No Grazing alternative would eliminate grazing based on five year average use.

c/ Based on Table 2-14, Present Livestock Grazing Situation.

d/ Five year average includes an average of all holders of the particular permit, not just the current operators.

e/ Initial and future allocation based on percent of permittee's 1978 authorized livestock demand and proposed allocations (see Table 1-1 and 1-2)

f/ Number of AUMs in 1978-79 license in conflict with proposed periods-of-use (see Table 1-1).

g/ Cost apportioned based on percent of permittee's 1978 authorized livestock demand.

h/ Initial and future AUMs based on percent of permittees 1978 authorized livestock demand and proposed allocations (See Tables 1-1 and 1-2).

APPENDIX K
TABLE K-2
BUDGET FOR SMALL RANCH
(Less than 200 Brood Cows)

	Units	Number of Units	Value ($)
Production			
Steer Calves	Cwt a/	60.0	4,260
Heifer Calves	Cwt	80.5	4,870
Feeder Steers	Cwt	195.0	11,700
Cull Cows	Cwt	153.0	6,044
TOTAL Receipts			26,874
Cash Costs			
Public Grazing--BLM	AUMs b/	1,191	1,798
Public Grazing--FS	AUMs	208	333
Crop Residue	AUMs	63	0
Irrigated Pasture	AUMs	158	240
Native Hay	Ton	49	1,028
Other Hay	Ton	12	262
Salt and Minerals	Cwt	18	74
Trucking			15
Marketing			75
Livestock Taxes			270
Organizations			130
Veterinary and Medical			18
Machinery, Fuel, and Lube			1,365
Machinery Repair			747
Equipment Repair			127
Equipment Labor	Hr c/	3.1	22
Interest on Operating Cpt.			592
General Farm Overhead			925
Insurance			553
Taxes (Non-Livestock)			698
TOTAL Cash Costs			9,272
Operator Labor	Hr	2,013.0	7,448
Depreciation			2,874
Net Ranch Income			7,280
Interest--Machinery and Equipment			1,201
Interest--Livestock			4,642
Return to Land and Investment			1,437
Management Charge			1,746
Land Charge			5,468
Returns Risk			5,771

a/ Cwt= Per hundred weight.

b/ AUMs= Animal Unit Months.

c/ Hr= Hour.

Source: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Tonopah Resource Area Ranch Budget, November 1979.

APPENDIX K
TABLE K-3
BUDGET FOR MEDIUM RANCH
(250-600 Brood Cows)

	Units	Number of Units	Value ($)
Production			
Steer Calves	Cwt a/	315.4	22,390
Heifer Calves	Cwt	85.2	5,155
Feeder Steers	Cwt	260.0	14,755
Feeder Heifers	Cwt	240.0	12,960
Cull Cows	Cwt	360.0	14,220
TOTAL Receipts			69,480
Cash Costs			
Public Grazing--BLM	AUMs b/	3,370	5,089
Public Grazing--FS	AUMs	1,185	1,896
Crop Residue	AUMs	75	0
Irrigated Pasture	AUMs	159	227
Alfalfa	Ton	68	2,186
Salt and Minerals	Cwt	79.2	317
Trucking			5,400
Marketing			426
Livestock Taxes			1,080
Organizations			350
Veterinary and Medical			54
Non-Operator Labor			7,704
Machinery, Fuel, and Lube			2,423
Machinery Repair			1,305
Equipment Repair			182
Equipment Labor	Hr c/	3.1	39
Interest on Operating Cpt.			1,856
General Farm Overhead			2,625
Insurance			1,396
Taxes (Non-Livestock)			756
TOTAL Cash Costs			35,311
Non Cash Costs			
Operator Labor	Hr	2,702.7	10,000
Depreciation			4,839
Net Ranch Income			19,330
Interest--Machinery and Equipment			1,774
Interest--Livestock			13,456
Return to Land and Investment			4,100
Management Charge			4,544
Land Charge			5,116
Returns to Risk			-5,560

a/ Cwt= Per hundred weight.

b/ AUMs= Animal Unit Months.

c/ Hr= Hour.

Source: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Tonopah Resource Area Ranch Budget, November 1979.

APPENDIX K
TABLE K-4
BUDGET FOR LARGE RANCH
(760-5,000 Brood Cows)

	Units	Number of Units	Value ($)
Production			
Steer Calves	Cwt a/	1,312.5	93,188
Heifer Calves	Cwt	730.0	44,165
Feeder Steers	Cwt	2,378.0	156,353
Feeder Heifers	Cwt	666.0	38,295
Cull Cows	Cwt	2,805.0	104,122
TOTAL Receipts			436,123
Cash Costs			
Public Grazing--BLM	AUMs b/	15,298	23,100
Public Grazing--FS	AUMs	3,249	5,198
Crop Residue	AUMs	4,874	0
Irrigated Pasture	AUMs	6,400	10,971
Native Hay	Ton	175.4	3,710
Salt and Minerals	Cwt	440.2	1,760
Trucking			2,662
Marketing			790
Livestock Taxes			7,149
Organizations			500
Veterinary and Medical			1,330
Non-Operator Labor	Hr c/	5,405	20,000
Machinery, Fuel and Lube			7,283
Machinery Repair			4,148
Equipment Repair			503
Equipment Labor	Hr	35.6	96
Interest on Operating Cpt.			4,902
General Farm Overhead			12,056
Insurance			7,496
Taxes (Non-Livestock)			21,630
TOTAL Cash Costs			135,284
Non Cash Costs			
Operator Labor	Hr	4,551	16,837
Depreciation			14,060
Net Ranch Income			269,942
Interest--Machinery and Equipment			6,050
Interest--Livestock			78,038
Return to Land and Investment			185,854
Management Charge			15,717
Land Charge			229,169
Returns to Risk			-59,032

a/ Cwt= Per hundred weight.

b/ AUMs= Animal Unit Months.

c/ Hr= Hour.

Source: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Tonopah Resource Area Ranch Budget, November 1979.

APPENDIX K
TABLE K-5
BUDGET FOR SHEEP ENTERPRISE
(Over 2,500 Head)

	Units	Number of Units	Value ($)
Production			
Slaughter Lambs	Cwt a/	2,339	144,612
Feeder Lambs	Cwt	653	45,329
Ewes	Cwt	622	15,867
Wool	Lbs	4,118	31,132
Wool Incentive Payment			14,009
Unshorn Lamb Payment	Cwt	2,992	4,009
TOTAL Receipts			254,958
Cash Costs			
Public Grazing--BLM	AUMs b/	4,138	6,209
Public Grazing--FS	AUMs	1,541	2,466
Pasture Rent			17,465
Private Range	Acre	11,803	3,308
Irrigated Pasture	Acre	173	0
Crop Residue	Acre	199	0
Sheep Pellet	Ton	4	407
Hay (purchased)	Ton	119	5,117
Hay (produced)	Ton	97	2,473
Grain (purchased)	Ton	41	3,458
Protein Supplement	Ton	9	1,195
Other Feed			360
Salt and Minerals			1,208
Spray and Dipping			78
Veterinary and Medical			1,212
Marketing			322
Trucking			6,324
Shearing and Tagging	Head	4,118	6,259
Utilities			1,384
Lamb Promotion			97
Organizations			315
Legal and Accounting			1,228
Wool Storage			234
Predator Control			2,124
Ram Death Loss	Head	9	1,960
Fuel and Lube			3,185
Repair			3,405
Non-Operator Labor			19,935
Interest on Operating Cpt.			5,979
Land Taxes			5,765
Other Taxes			507
Insurance			2,863
General Farm Overhead			3,783
TOTAL Cash Costs			110,625
Non Cash Costs			
Operator Labor	Hr c/		7,475
Depreciation			15,284
Net Ranch Income			121,574
Interest--Machinery and Equipment			3,594
Interest--Livestock			27,733
Return to Land and Investment			90,247
Management Charge			11,126
Land Charge			100,257
Returns to Risk			-21,137

a/ Cwt= Per hundred weight.

b/ AUMs= Animal Unit Months.

c/ Hr= Hour.

Source: U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, Tonopah Resource Area Ranch Budget, November 1979.

hunters are not charged for hunter days and they may receive a bonus over what they would be willing to pay. An estimate of a value of hunting based on a 1975 survey by species is shown in Table K-7.

Based on the dollar estimates shown in Table K-7, The value of big and small game hunting in the Tonopah Resource Area was $524,100 (5,400 deer hunter days x $83 per day + 2,300 small game hunter days x $33 per day).

REGIONAL ECONOMIC IMPACTS

Industrial sectors are related in a regional economy; an industry produces goods that are used as inputs by other industrial sectors and in turn uses other industry's products as inputs into their production processes. A change in any sector will therefore have impacts in many sectors.

To measure these changes an input-output model developed by the Forest Service was used (USDA, Forest Service 1979 and Palmer 1978). The model used proposed changes in physical outputs (i.e., AUM reductions or hunter day increases) to determine changes in output of other sectors. Changes in income and employment are then computed.

The input-output model used includes Nye, White Pine, and Elko counties. Because this analysis focuses on Nye county, only the changes (instead of the totals) were used. Use of a regional model that is larger than the area of analysis will slightly inflate the impacts. However, it was felt that this effect would be relatively minor due to the similarities of the economies involved. Table K-8 shows the data base (for Nye, White Pine, and Elko counties) used in the input-output analysis.

Changes in sheep AUMs were not included in the regional economic analysis for the following reasons:

1) Numbers of sheep have been declining in the Tonopah Resource Area. Sheep use is well below the active preference level, and there are no reasons to expect this situation to change.

2) All sheep operations are based outside the Tonopah Resource Area with ranchers utilizing the area for only a few months each year. Therefore, the major impacts of any changes in income and employment will occur outside the region.

A list of inputs used for the computer runs (Forest Service Model) is shown in Table K-9. Results of the analysis are shown in Tables 3-17 and 3-19.

In June, July, and August of 1979, two Bureau of Land Management social scientists contacted 16 of the resource area permittees to discuss social values and attitudes of the resource area ranching community as well as discussing their concerns related to the economic aspects of their ranching operation. Nine of these ranchers were contacted in person, three informally discussed their concerns over the telephone, and four returned completed questionnaires (nine questionnaires were mailed out). In addition, various secondary data sources, i.e., newspapers, BLM public participation records, and various other Bureau planning documents which reflected publicly expressed local and regional views and attitudes were reviewed in detail. A study conducted under contract to BLM by Dr. M. Richard Ganzel, Bureau of Government Research, University of Nevada, Reno, Nevada, in November 1976, also supplied a great deal of background information on local and regional social values and attitudes.

All of the ranchers who hold grazing permits in the resource area were contacted in an effort to maximize ranching community input into the social-economic sections of the Environmental Impact Statement. Of twenty-nine ranchers contacted, only 16 supplied social-economic data that were subsequently aggregated and analyzed in the social-economic section of the Environmental Impact Statement.

Because of Office of Management and Budget (OMB) constraints, the sociological data presented were derived from guided conversations rather than formalized or structured interviews. The interviewers had several topics in mind, but the content of the discussions varied and not every topic was covered in each interview. Field notes were taken during the conversations and later content-analyzed. Comments were listed if they seemed significant to the interviewer, if they recurred in several of the interviews or were especially emphasized by the respondent(s). See Tables K 10, 11, 12, 13, 14, and 15 for selected comments and the number of interviews in which the substance of each was repeated.

APPENDIX K
TABLE K-6
NUMBER OF HUNTER DAYS

	Mule Deer Number of Hunter days	Antelope Number of Hunter days
Existing Situation	5,400	50
Changes as a result of:		
Proposed Action		
Short-Term	6,408	87
Long-Term	7,227	87
No Action		
Short-Term	No change	
Long-Term		
No Livestock Grazing		
Short-Term	6,408	87
Long-Term	7,760	87
Livestock Reduction/ Maximizing Wild Horses		
Short-Term	6,408	87
Long-Term	7,760	87

Source: Goicoechea, David. Bureau of Land Management, Nevada State Office, Wildlife Biologist, personnal communication on changes in 1978 hunter days, January 1980.

APPENDIX K
TABLE K-7
VALUE OF HUNTING IN NEVADA

Big Game Hunting	1978 Value of a/ Hunter Day (dollars)
Deer	83
Elk	23
Antelope	43
Other Big Game	167
Small Game Hunting	33
Upland Bird Hunting	85
Waterfowl Hunting	55
Fishing	29

a/ Value updated from 1975 estimates by a change in the consumer price index of 15%.

Source: U.S. Department of Agriculture, Forest Service, 1977.

APPENDIX K
TABLE K-8
BASE INPUT-OUTPUT DATA a/

Sector	Total Gross Output ($1000)	Labor (Work Years)	Income (1000)
Agriculture, Livestock	29,880,913	354	12,036,032
Agriculture Crops + Other	4,751,283	167	1,958,954
Metal Mining	54,324,574	735	12,782,572
Oil + Gas	4,467,887	20	470,469
Other Mining	30,296,901	478	5,913,955
Construction	23,105,704	458	6,915,537
Food + Kindred Pdts	351,556	3	27,914
Other Wood Products	200,965	4	43,027
Other Furniture + Fix.	36,849	1	11,291
Printing + Publishing	2,780,289	60	665,879
Stone, Clay, and Glass	850,722	14	220,762
Primary Metal	19,077,344	210	3,624,695
Fabricated Metal + Mach.	60,705	1	13,950
Other Manufacturing	812,595	9	134,810
Transportation	10,037,730	251	3,480,081
Communication	39,785,096	377	6,508,842
Wholesale Trade	9,445,058	243	3,154,649
Auto Deal + Gas Sta.	14,053,101	530	6,073,750
Eating and Drinking Est.	9,613,755	850	2,878,358
Other Retail Trade	15,761,254	804	5,968,787
Finance, Insur., Real Estate	25,359,885	398	4,156,485
Lodging	15,280,832	1,128	6,306,399
Recreation Service	11,408,493	616	3,365,505
Other Services	98,327,940	3,896	34,709,763
Private Sectors	420,071,431	11,607	121,422,466
Government and Misc.	000	480	6,183,800
TOTAL	420,071,431	12,085	127,606,266

a/ Data for Nye, White Pine and Elko counties.

Source: U.S. Department of Agriculture, Forest Service, Intermountain Region, Ogden Utah. Computer printout, January 1980.

APPENDIX K
TABLE K-9
INPUTS USED IN INPUT-OUTPUT ANALYSIS

	Cattle AUMs	Sheep AUMs	Number of hunter days	Operation and Admin. Expense ($1,000)
Proposed Action				
Initial AUM Allocation	-8,595	0	0	0
Short-term	-8,595	0	1,045	260
Long-term	28,224	0	1,864	260
Implementation Assumptions	-28,659	0	0	0
No Action Alternative	0	0	0	0
No Livestock Grazing Alternative				
Initial AUM Allocation	-116,125	-2,816	0	0
Short-term	-116,125	-2,816	1,045	0
Long-term	-116,125	-2,816	2,397	0
Livestock Reduction/ Maximizing Wild Horses Alternative				
Initial AUM Allocation	-76,750	0	0	0
Short-term	-76,750	0	1,045	130
Long-term	-66,951	0	2,397	130

a/ Increases in Sheep AUMs were excluded from analysis.

APPENDIX K
TABLE K-10
STATEMENTS ON MOTIVATION FOR RANCHING

Essential Content of Statements	Number Making Statement a/
Ranching is a way of carrying on a family tradition	16
Ranching provides a place for children to have meaningful work and responsibility	6
Ranching permits one to work outdoors	16
Ranching provides an opportunity to be one's own boss	13
Like working with animals	10
Develops independence and self-reliance	14

a/ Comments from 16 respondents were used in this analysis.

APPENDIX K
TABLE K-11
STATEMENTS ON RANCHING ECONOMIC CONSIDERATION

Essential Content of Statements	Number Making Statement a/
Ranching provides an opportunity for tax advantages	7
Ranching provides an opportunity to make a profit	13
Ranching in the area is dependent on grazing on public lands	16
Ranching taxes pay for urban services	3
Ranching is important to the economy of Nye County	8

a/ Comments from 16 respondents were used in this analysis.

APPENDIX K
TABLE K-12
STATEMENTS ON WILD HORSES

Essential Content of Statements	Number Making Statement a/
Federal government has been unable to control wild horse populations	14
Should maintain some wild horses and burros, but under strict controls	12
Wild horses do irrepairable damage to the public domain	15
Wild horses are an essential element of our heritage	6
Wild horses are of no value	5
AUMs allocated to wild horses should be given to livestock to produce more red meat	10
Range privileges should be shared among livestock, wild horses, and wildlife	5

a/ Comments from 16 respondents and two members of wild horse interest groups were used in this analysis.

APPENDIX K
TABLE K-13
STATEMENTS ON RESPONSES TO CUTS IN BLM GRAZING PREFERENCES

Essential Content of Statements	Number Making Statement a/
Skeptical about implementation of AMPs	9
Feel AMPs are the "only way to go"	7
Large ranchers can stand AUM reductions better than small ranchers	7
Feel BLM should use trend data to determine condition of public domain	11
Some may have to reduce operations or sell out	9
Should be more rancher input into BLM grazing decisions	15
Corporate agribusinesses will buy ranches of those who feel forced to sell	9
Periods-of-use constraints would require more capital/labor intensive form of management	9

a/ Comments from 16 respondents were used in this analysis.

APPENDIX K
TABLE K-14
STATEMENTS ON RELATIONS WITH GOVERNMENT

Essential Content of Statements	Number Making Statement a/
Approve of State legislature seizure of federal lands	12
Washington BLM office makes all decisions affecting grazing in Nevada	11
Federal government intervention in livestock industry creates confusion and uncertainty	12
State government would be more responsive to rancher needs	12
Approve of BLM management of the public domain	2
Washington BLM decisionmakers ignore local public input in the decision making process	12
Most local BLM employees do not understand desert ranching operations	10
Multiple-use conflicts place tremendous pressure on BLM management	10

a/ Comments from 16 respondents were used in this analysis.

APPENDIX K
TABLE K-15
STATEMENTS ON WILDERNESS AND RECREATION

Essential Content of Statements	Number Making Statement a/
Wilderness programs will lock-up land forever; another federal land grab	12
Don't need wilderness areas	10
Feel wilderness areas may provide more tourism opportunities	4
No conflict between wilderness areas and ranching	10
Aged and physically handicapped won't be able to enjoy	3
No conflict between wilderness and hunting, fishing, hiking, and camping	14
No conflict between ranching and ORV activity	10
Mining should take precedence over wilderness designation	7

a/ Comments from 16 respondents were used in this analysis.

APPENDIX L

THREATENED OR ENDANGERED SPECIES INPUT REQUEST FROM FISH AND WILDLIFE SERVICE

1972
(N-061.1)

District Office
P.O. Box 194
Battle Mountain, NV 89820

November 27, 1979

Fish and Wildlife Service
2800 Cottage Way
Sacramento, California 98525

Attention: William D. Sweeney, Area Manager

Dear Mr. Sweeney:

There are two environmental impact statements (EISs) being prepared within the Battle Mountain District. The purpose for this letter is to request consultation and input from the Fish and Wildlife Service concerning threatened and endangered plants and animals occurring within the EIS areas. The two actions involved are the Anaconda Nevada Moly Project in Big Smoky Valley and the Tonopah Grazing EIS.

Briefly, the proposed action for the Anaconda Nevada Moly Project EIS is for the Sierra Pacific Power Company to construct a 230 KV transmission line for the Anaconda Copper Company. The transmission line would begin from a point on an existing transmission line near Austin, Nevada and run approximately 90 miles south down the east side of the Big Smoky Valley to the Anaconda Mining properties located about 18 miles north of Tonopah, Nevada (See Map 1). The EIS is being prepared by Ecology Consultants, Inc. of Fort Collins, Colorado, under the direction of the BLM. Alternatives to the proposed action are no action, and construction along Highway 8A using the highway as a center line for a 1,000 foot wide corridor (See Map 1). Since the EIS is just now being prepared, possible impacts to any existing T/E plants or animals is not known at this time.

The proposed action for the Tonopah Grazing EIS is to allocate available vegetation to big game, wild horses, and livestock by allotment. Alternatives to the proposed action include no action, no livestock grazing, and livestock reduction/maximizing wild horses which are all various methods to allocate the same vegetation to the same users (See Map 2). There will also be proposed livestock support facilities, i.e., fences, water developments, land treatments, etc., with the proposed action and livestock reduction alternative. The proposed land treatment areas are shown on Map 2. The exact locations for the other projects will not be determined until after the EIS is final and allotment management plans are written. Possible impacts to the existing T/E plants (See Map 2) would be by grazing and project disturbance. That portion of the proposed transmission line located in the Tonopah Resource Area will be impacted by both EISs (See Maps 1 and 2).

Since both EISs are being prepared under stringent time frames and have final due dates of September 30, 1980 it would be appreciated to have your response to this request by May 30, 1980, so that it can be included in the final EIS.

Sincerely,

Michael C. Mitchel
Acting District Manager

Enclosures (2):
Map 1: Anaconda Nevada Moly Project EIS

Map 2: Tonopah Grazing EIS

GLOSSARY

GLOSSARY

ACTIVE USE: Livestock grazing preference which is currently being used.

ACTUAL USE: The use made of forage on any area by livestock and/or game animals without consideration of permitted or recommended use. It is usually expressed in terms of Animal Unit Months or Animal Units.

ALLOTMENT: An area designated for the use of a prescribed number and kind of livestock under one plan of management.

ALLOTMENT MANAGEMENT PLAN (AMP): A documented program which applies to livestock operations on the public lands, which is prepared in consultation with the permittee(s) or lessee(s) involved, and which: 1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for the public lands through land use planning; 2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the public lands to meet the livestock grazing and other objectives of land management; and, 3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

ANIMAL UNIT (AU): Considered to be one mature (1,000 pounds) cow or its equivalent based upon average daily forage consumption of 26 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM): The amount of forage necessary for the sustenance of one cow or its equivalent (e.g. 4 deer, 5 antelope, 5 bighorn sheep, 1.25 elk, or 1 horse) for one month.

APPARENT RANGE TREND: Change in vegetation and soil characteristics resulting directly from environmental factors, primarily climate and grazing as observed at one point in time.

ARTIFACT: Any object made, modified, or used by man, usually movable.

ASPECT (Vegetation): The appearance that a dominant or most common species of vegetation gives to the viewer, i.e., shortgrass, pinyon-juniper, big sagebrush.

AUTHORIZED USE: The total number of Animal Unit Months of livestock grazing on public lands, apportioned and attached to base property owned or controlled by a permittee or lessee.

BAND: A group of wild horses which have established a home range.

CALF CROP: The number of calves weaned from a given number of cows, usually expressed in percent.

CARRYING CAPACITY: The maximum amount of grazing use possible without inducing damage to vegetation or related resources. Carrying capacity may vary from year to year on the same area due to fluctuating forage production.

CATTLEGUARD: A device or structure, at points where roads or railroads cross a fence line, that is so designed that vehicular travel is uninterrupted, but crossing by all kinds of livestock is restricted.

CLASS I INVENTORY: An inventory study of a defined area designed to provide a narrative overview derived from existing cultural resource data and to provide a compilation of existing cultural resource site record data.

CLASS II INVENTORY: A sample-oriented field inventory of cultural resources.

CLIMAX: The highest ecological development of a plant community capable of perpetuation under the prevailing climatic and soil conditions.

COW-CALF OPERATIONS: A beef enterprise in which production is of calves and the calves are marketed soon after weaning.

CRITICAL GROWTH PERIOD: The period in a plant's growth cycle when food reserves are lowest and grazing is most harmful.

CULTURAL RESOURCES: Those fragile and nonrenewable remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features, that were of importance in human events. These resources consist of 1) physical remains, 2) areas where significant human events occurred–even though evidence of the event no longer remains, and 3) the environment immediately surrounding the resource.

DESIGNATED GROUNDWATER BASIN: A basin where the perennial water yield is equal to the withdrawal as noted by the Nevada State Water Engineer.

DESIRABLE PLANT SPECIES: Species which contribute to management objectives.

ECOLOGICAL RANGE CONDITION: The present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. Range condition is basically an ecological rating of the plant community.

Four classes are used to express the degree to which the composition of the present plant community reflects that of the climax. They are:

Range condition class	Percentage of present plant community that is climax for the range site
Climax--Excellent	76-100
High--Good	51-75
Medium--Fair	26-50
Low--Poor	0-25

ENDANGERED SPECIES: Any species in danger of extinction throughout all or a significant portion of its range.

EROSION CONDITION CLASSES: *A) STABLE*–The surface soil is intact with no recent sign of soil movement. Soil is in place with no sign of transportation of sediment. Surface litter is usually accumulating in place. Erosion pavement, if present, may have desert varnish. Erosion pavement may be present as a result of erosional activity previous to the last 10 years. Gullies may be present in a mature condition with flat bottoms and vegetation established on all surfaces. SSF = 0-20. *B) SLIGHT*–Stable surface conditions prevail with a small amount of erosion in evidence. From 10 to 25 percent of the surface soil has been removed. Comparable alluvial deposition may be evident. There are visible flow patterns with rills of 1/2 inch depth occurring at infrequent

intervals of more than 10 feet. No pedestals are present. An active small gully (5 feet deep or less) is present occasionally (100 feet or more apart). Movement of soil by water and wind is visible. Erosion pavement may be present but it will not be coated with desert varnish. SSF = 21-40. *C) MODERATE*-Recent movement of soil is plain. Twenty-five to 75 percent of the surface soil has been removed. Alluvial deposits may have occurred. Small alluvial terraces may be formed against litter, vegetation, or rocks. These are usually less than one inch high. Rills of 1/2 to 6 inches deep occur at intervals of 10 feet. An occasional medium gully (5-10 feet deep) may occur at intervals of 100 feet or more. Rills and gullying covering more than 75 percent of the area will throw the erosion into a higher class. Pedestalling is evident. Erosion pavement may be present. SSF = 41-60. *D) CRITICAL*-Active critical erosion is evident. Seventy-five percent or more of the surface soil has been removed. Some of the subsoil may have been removed. Rills may be numerous. Shallow (less than five feet), moderate (5-10 feet), and some deep (10-15 feet) gullies may be present. Plants are pedestalled and deposits of soil and debris are noticeable throughout the watershed. Drainage patterns contain silt and sand deposits. Recent erosion pavement has been formed on gravelly and stony soils. SSF = 61-80.

EXTENSIVE (Cultural Resource Survey): A sample-oriented field inventory designed to locate and record all cultural resources sites within a portion of a defined area.

FECAL COLIFORM: A bacteria found in the fecal material of all warm blooded animals.

FOURTH ORDER: Order of survey is an indication of detail of survey. A third order survey is more detailed than a fourth order survey. The greater amount of detail is a result of either a larger scale of mapping (i.e., 2 inches to the mile is a larger scale than 1 inch to the mile) or a greater number of test pits per unit area or both.

GRAZING PREFERENCE: The total number of Animal Unit Months of livestock grazing on public lands, apportioned and attached to base property owned or controlled by a permittee or lessee.

GRAZING TREATMENT: Under a grazing system, grazing or resting a particular unit of land (usually a pasture) at particular times each year to attain particular vegetative goals.

GRAZING SYSTEM: A systematic sequence of grazing use and nonuse of an allotment to reach identified multiple-use goals or objectives by improving the quality and quantity of the vegetation.

GREEN UP: When plants start producing new vegetative growth.

HEAD CUT: The cutting away of soil by erosion in a meadow or along a stream course.

HOME RANGE: Applies to a band of wild horses travelling about a specific area in carrying out normal activities.

INTENSIVE (Cultural Resources Survey): A field inventory designed to locate and record all cultural resources sites within a specified area (Class III).

INTENSIVE GRAZING MANAGEMENT: A method for managing grazing resources considering a number of factors and implementing a specified grazing system as detailed in an Allotment Management Plan.

ISOLATED FIND: A single object without other associated artifacts, historic or prehistoric.

KEY AREA: 1) A portion of range, which, because of its location and grazing value, serves as an indicative sample of range condition, trend, or degree of use. A key area that guides the general management of the entire area of which it is a part. 2) An area upon which the success of the ranching operation is largely dependent.

KEY SPECIES: 1) Forage species whose use serves as an indicator to the degree of use of associated species. 2) Those species which must, because of their importance, be considered in the management program.

KIDDING GROUNDS/LAMBING GROUNDS: The area where young of the species are born.

LESS INTENSIVE GRAZING MANAGEMENT: A method for managing grazing resources which will maintain proper use of the vegetative resource.

LITTER: A surface layer of loose organic debris consisting of freshly fallen or slightly decomposed organic materials.

LIVESTOCK FORAGE CONDITION: Is the relative position of a range with regard to an attainable standard determined by resource managers on the basis of site potentialities. Condition is determined by interpreting the ability of vegetation (quality and quantity) to provide sustained livestock forage and soil stability.

LIVESTOCK SUPPORT FACILITIES: Structures, actions, or practices that increase forage production, improve watershed and range condition, or facilitate management of the range or the livestock grazing on it.

LONG-TERM: A point in time 35 years following the completion of the EIS.

MANAGEMENT FRAMEWORK PLAN (MFP): Land use plan for public lands that provides a set of goals, objectives, and constraints for a specific planning area to guide the development of detailed plans for the management of each resource.

MITIGATION: Measures taken to minimize or eliminate adverse impacts. These may include design features in the proposed action or alternatives. Bureau management is committed to mitigation measures.

MULTIPLE-USE: The management of public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

NATIONAL REGISTER OF HISTORIC PLACES: The official list, established by the Historic Preservation Act of 1966, of the Nation's cultural resources worthy of preservation.

OPTIMUM NUMBERS: The number of wild horses as determined by the Tonopah MFP.

PERIODS-OF-USE (wildlife): The time of year a wildlife species is on a particular habitat area.

PERIODS-OF-USE (domestic animals): The time of year when domestic animals would be allowed on a specific unit of range, as designated by permit.

PERMITTEE: One who holds a permit to graze livestock on state, federal, or certain privately owned lands.

PHASE I WATERSHED: A systematic procedure for inventory, analysis, plans, programs, and treatments required to solve watershed problems; see BLM Manual 7322.

PHENODYNAMICS: The pattern of phenological growth.

PHENOLOGY: The study of periodic biological phenomenon such as flowering, seeding, etc., especially as related to climate.

PINYON-JUNIPER ENCROACHMENT: Pinyon and juniper spread into an area where they previously did not occur.

POTENTIALLY SUITABLE: Range which is presently unsuitable for livestock that has the potential to be suitable for livestock through management.

PACIFIC SOUTHWEST INTER-AGENCY COMMITTEE (PSIAC): The PSIAC method is used to compute soil loss.

PUBLIC LANDS: These lands are administered by the Secretary of the Interior through the Bureau of Land Management.

RANGE IMPROVEMENT: A structure, development, or treatment used to rehabilitate, protect, or improve the public lands to advance range betterment.

RANGE SITE: A distinctive kind of rangeland that differs from other kinds in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind of proportion of species or in total production.

RANGE TREND: The direction of change in range condition over a period of time.

REASONABLE NUMBERS: The average population estimates for mule deer, antelope, bighorn sheep and elk over a 15 year period (1961-1975).

RECRUITMENT RATE: The net annual increase in a population.

REGULAR NONUSE: Nonuse of allowable grazing in AUMs by choice of a livestock operator for any of a variety of reasons.

ROCK ART: Drawings made on or carved into rock.

ROCK SHELTER: A naturally occurring rock overhang that provided a protected location for human habitation.

SALVAGE: The recovery of material and data from an affected cultural resource, prior to its alteration or destruction, through recordation, documentation, partial or total excavation, and collection for analysis and interpretation.

SEED RIPE: A phenological phase in the development of a plant at which time seed is mature.

SHORT-TERM: The period of time needed to implement management's decisions following the completion of the EIS, approximately seven years.

SHOSHONE: The group of Indians living in the Tonopah Resource Area at the time of historic settlement.

SITE (Cultural Resources): The physical location where past human activities or events occurred.

SIGNIFICANT IMPACT: A meaningful standard to which an action may impact the environment. This impact may be beneficial, adverse, direct, indirect, cumulative, and may have short-term or long-term effects.

SOIL ASSOCIATION: A group of defined and named taxonomic soil units occurring together in an individual and characteristic pattern over a geographic region.

SPRING DEVELOPMENT: A permanent structure to provide drinkable water for livestock, wild horses, and wildlife.

SUSTAINED YIELD: The achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use.

THIRD ORDER: Order of survey is an indication of detail of survey. A third order survey is more detailed than a fourth order survey. The greater amount of detail is a result of either a larger scale of mapping (i.e., 2 inches to the mile is a larger scale than 1 inch to the mile) or a greater number of test pits per unit area or both.

THREATENED SPECIES: Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.

TREND PLOTS: A permanent plot either 3'X 3' or 5'X 5' in which measurements or estimates are used to document quantitative vegetation changes that occur over a period of time.

TRESPASS (Grazing): The grazing of livestock on a range area without proper authority, resulting from a willful or negligent act.

UNAVOIDABLE ADVERSE IMPACTS: Residual adverse impacts that would remain after mitigation is applied.

UNIT RESOURCE ANALYSIS (URA): A comprehensive display of physical resource data and an analysis of the current use, production, condition and trend of the resource and the potentials and opportunities within a planning unit, including a profile of ecological values.

UTILIZATION: The proportion of current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole.

UTILIZATION CAGES: A study plot that determines proportion of the current year's forage production that is consumed or destroyed by grazing animals.

VEGETATION ALLOCATION: Available vegetation reserved for livestock, big game, and wild horses as determined from the 1959-64 range survey.

VEGETATION TYPE: A plant community with distinguishable characteristics.

VISUAL RESOURCES: Land, water, vegetation, animals, and other visible features.

WATERSHED: A geographical area not necessarily a water drainage of a size whose physical and other characteristics are adequately related to serve as a logical unit for analysis, planning, and programing.

WORK YEAR: Full time equivalent employment for one person for one year or 2000 hours.

YEARLING: An animal approximately one year of age. A short yearling is from 9 to 12 months of age and a long yearling is from 12 to 18 months.

ACRONYMS

AMP: Allotment Management Plan.
AU: Animal Unit.
AUM: Animal Unit Month.
BLM: Bureau of Land Management.
CEQ: Council on Environmental Quality.
EPA: Environmental Protection Agency.
ESCS: Economics, Statistics, and Cooperatives Service.
FS: Forest Service.
FLPMA: Federal Land Policy and Management Act.
FWPCA: Federal Water Pollution Control Administration.
HMP: Habitat Management Plan.
IMP: Interim Management Plan (Wilderness).
MFP: Management Framework Plan.
NDW: Nevada Department of Wildlife (formerly the Nevada Department of Fish and Game).
NEPA: National Environmental Policy Act.
NRC: National Resource Consultants.
PSIAC: Pacific Southwest Inter-Agency Committee.
RIS: Recreation Information System.
SCS: Soil Conservation Service
SSF: Soil Surface Factor.
URA: Unit Resource Analysis.
USDA: United States Department of Agriculture.
USDI: United States Department of the Interior.

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